



Configurator 2.0 Software

OPERATIONS MANUAL

Super Systems Inc.
7205 Edington Drive
Cincinnati, OH 45249
513-772-0060 / 800-666-4330
Fax: 513-772-9466
www.supersystems.com

Table of Contents

Table of Contents.....	2
Main Menu.....	8
Toolbar Buttons	9
1. The Connection button	9
2. The Login button	9
3. The Show Overview Display button	9
4. The System Settings button	9
Manage Controllers Tab.....	10
Backup/Restore Tab	13
Users Tab	17
Configuration Tab	19
R/W Data	21
Set Factory Defaults	22
FD Preserve	23
5. The Recipe Editor button	23
Recipe Editor Tab.....	24
Recipe Management Tab	26
Configurator Main Form	29
9200 Firmware Upgrade Procedure	35
Overview	35
Equipment Required	35
Instructions	35
Configurator – 8500 Drop-Down Menu	43
Input Values	43
Range Setups	44
Calibration	45
TC Type mV Range Chart	46
Zero Calibration	46
Span Calibration.....	47
Cold Junction Calibration	47
Configurator-9005 Drop-Down Menu	49
Recipe 1 – Recipe 4.....	49
Slave Instruments	49
Auxiliary A/I.....	49
Manual Event Control	49
Event Run Program Setup.....	49
Port Setup	50
Slave Instrument Setup	50
Zone Assignments – Programmer 1 – Zone Assignments - Programmer 4.....	52
Furnace Setup	52
Programmer Setup	54
Passcode and Alarm	55
IP Address	55
Zone/Load TC Setup.....	55

Event Control.....	56
Set Menu Security	57
SSi Analog Input Setup.....	57
Generic Mapping Setups	58
Communications and Mapping Table Section.....	58
Block Write Table Section	60
IP Address Table Section	61
DF1 Configuration	62
Relay Assignments	63
Vacuum Gauge Setup	65
Relay Setpoints	67
Configurator-9120 Drop-Down Menu	68
Burnoff.....	68
Slave Instruments	68
Aux Analog Inputs.....	68
Burnoff Setup	68
PID Loop Setup.....	68
Furnace Setup	68
Communications Setup	70
Slave Instrument Setup	70
Analog Input Setup	70
Analog Output Setup	71
Alarm Setup.....	72
Calibration	72
Configurator-9200 Drop-Down Menu	72
Burnoff.....	72
Slave Instruments	74
Auxiliary Analog Input	75
Manual Event Control	76
Probe Burnoff Setup.....	77
PID Loop Setup.....	78
Event Run Program Setup.....	87
Zone/Load TC Setup.....	88
Port Setup	89
Slave Instrument Setup	90
Zone Assignments.....	92
Furnace Setup	93
Default Wait Limits.....	94
Furnace Name	96
Alarm Setup.....	97
Relay Assignments	103
Relay Setpoints	106
Analog Input Setup	107
Analog Output setup	112
Passcode and Alarm	115
IP Address.....	117
Event Control.....	118
Valve Setup	119

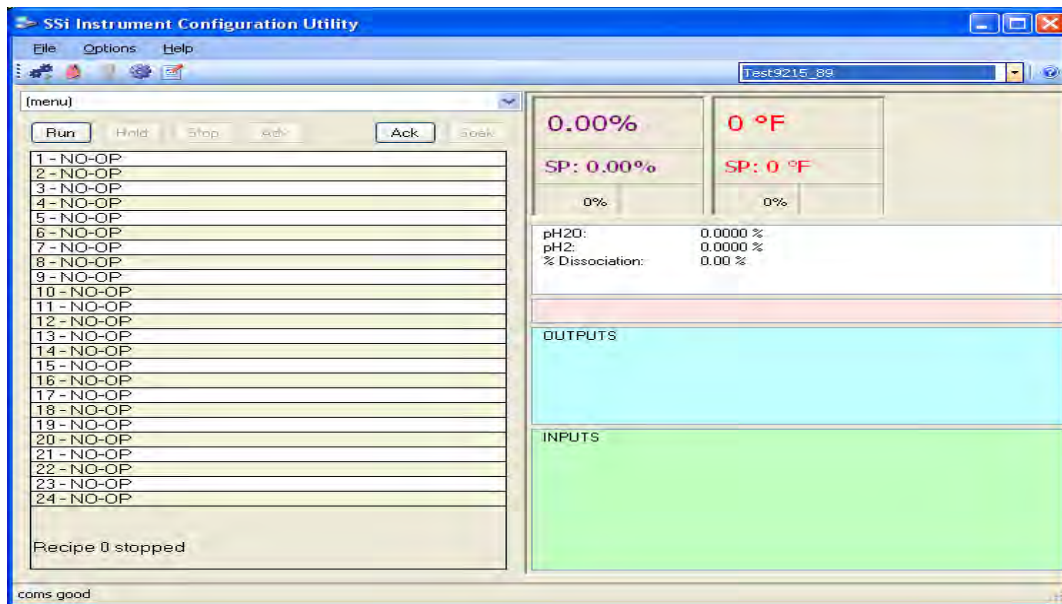
Valve Inputs	120
Set Menu Security	122
Curve Entry	123
Alternate PID Setup	124
SSI Analog Input Setup	125
SSi Configuration and Calibration	126
Overview	126
Equipment needed	126
Notes	126
User Calibration	127
Full Calibration	129
ADAM Module Offset Correction	130
Aux Setpoint Configuration	131
TC Extension Correction Curves	132
Tuning Assistant	133
Configurator – 9205 Drop-Down Menu	136
Burnoff	136
Slave Instruments	136
Auxiliary Analog Input	136
Manual Event Control	136
Probe Burnoff Setup	136
PID Loop Setup	136
Event Run Program Setup	136
Zone/Load TC Setup	136
Port Setup	136
Slave Instrument Setup	136
Zone Assignments	136
Furnace Setup	137
Default Wait Limits	137
Furnace Name	137
Alarm Setup	137
Relay Assignments	137
Relay Setpoints	137
Analog Input Setup	137
Analog Output Setup	137
Passcode and Alarm	137
IP Address	137
Event Control	137
Set Menu Security	138
Curve Entry	138
Alternate PID Setup	138
SSI Analog Input Setup	138
SSi Configuration and Calibration	138
ADAM Module Offset Correction	138
Aux Setpoint Configuration	138
Configurator – 9210 Drop-Down Menu	139
Slave Instruments	139
Auxiliary Analog Input	139

Manual Event Control	139
PID Loop Setup.....	139
Event Run Program Setup.....	139
Zone/Load TC Setup.....	139
Port Setup	139
Slave Instrument Setup	139
Zone Assignments	139
Furnace Setup	139
Default Wait Limits.....	139
Furnace Name	140
Alarm Setup.....	140
Relay Assignments	140
Relay Setpoints	140
Analog Input Setup	140
Analog Output Setup	140
Passcode and Alarm	140
IP Address	140
Event Control.....	140
Valve Configuration	140
Valve Setup	140
Set Menu Security	141
Curve Entry	141
Alternate PID Setup	141
SSi Analog Input Setup.....	141
SSi Configuration and Calibration	141
ADAM Module Offset Correction	141
Aux Setpoint Configuration	141
TC Extension Correction Curves	141
Tuning Assistant	141
Configurator – 9215 Drop-Down Menu	142
Slave Instruments	142
Auxiliary A/I.....	142
MGA	142
Manual Event Control	142
PID Loop Setup.....	142
Event Run Program Setup.....	143
Zone/Load TC Setup.....	143
Port Setup	143
Slave Instrument Setup	143
Zone Assignments	143
Furnace Setup	143
Default Wait Limits.....	145
Alarm Setup.....	145
Relay Assignments	145
Relay Setpoints	145
Analog Input Setup	145
Analog Output Setup	146
Passcode and Alarm	146

Generic Mapping Setups	146
DF1 Configuration	146
IP Address	146
Event Control	146
Vacuum Gauge Setup	146
Valve Configuration	147
Valve Setup	148
Custom Curves	149
Alternate PID Setup	149
SSi Analog Input Setup	149
SSi Configuration and Calibration	149
ADAM Module Offset Correction	149
Aux Setpoint Configuration	149
TC Extension Correction Curves	149
MGA Setup	150
Configurator-9220 Drop-Down Menu	153
Slave Instruments	153
Auxiliary Analog Input	153
Manual Event Control	153
PID Loop Setup	154
Event Run Program Setup	156
Zone/Load TC Setup	156
Port Setup	157
Slave Instrument Setup	158
Zone Assignments	159
Furnace Setup	160
Default Wait Limits	162
Furnace Name	162
Alarm Setup	162
Thermocouple Check	163
Relay Assignments	164
Relay Setpoints	166
Analog Input Setup	167
Analog Output Setup	169
Passcode and Alarm	170
IP Address	170
Event Control	170
Vacuum Gauge Setup	170
Set Menu Security	172
Custom Curves	172
Alternate PID Setup	172
SSi Analog Input Setup	173
SSi Configuration and Calibration	173
ADAM Module Offset Correction	174
Aux Setpoint Configuration	174
TC Extension Correction Curves	174
Tuning Assistant	174
Appendix A – Quench Control & Events	175

Appendix B – Opcodes.....	176
Control Group	176
Alarm Group	176
Events Group	176
Identity Group	177
Temperature Group.....	177
Time Group	177
Vacuum Group	178
SPP2 Group	178
Notes About Opcodes.....	179
BRANCH and LIMIT opcodes.....	180
Appendix C - Programmer Alarms.....	182
Appendix D - Flash Card Management	183
Appendix E - SDRRecorder Installation	184
Appendix F – Slave Instrument Mapping.....	186
Atmosphere Instruments	186
Temperature Instruments.....	190
Events Instruments	196
Appendix G – Examples	199
Example 1 – Cascade Setup for the 9205.....	199
Revision History	201

Main Menu




Configurator main display

The main menu consists of three sections: File, Options, and Help.


File

File → Close

This command will exit the Configurator application. This is the same as clicking on the close button on the top right of the form, .

Options

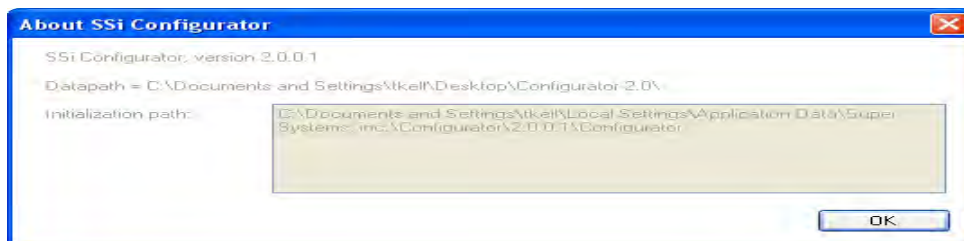
Options → Settings

This command will display the System Management form. This is the same as clicking on the System Settings button, .

Help

Help → About

This will display a small about screen.







Configurator – Help Screen


Toolbar Buttons

The toolbar across the top of the form, below the main menu, contains five icons:


1. The Connection button



When the program starts, the device is disconnected and the connect button will show . Also, the status bar in the bottom left corner will read "disconnected." To connect to a device, make sure that a device is selected from the drop-down list located on the top right of the form, and click this button. While the Configurator is in the process of connecting, the connect button will show . If a connection is successful, the connect button will show  and the status bar in the bottom left corner will read "coms good." If the connection is not successful, the connect button will remain  and the status bar in the bottom left corner will read "coms bad." Clicking on this button again will disconnect the device.

2. The Login button

There are four levels of security with the Configurator – Operator, Supervisor, Administrator, and SSi Special. Each level provides additional functionality with the Configurator software. When the program starts, the device is logged in as Operator and the login button will show  (blue). The Operator level does not require any passcodes. To login at a higher level, click on this button. A dialog box will pop up with a field for a user name and password.




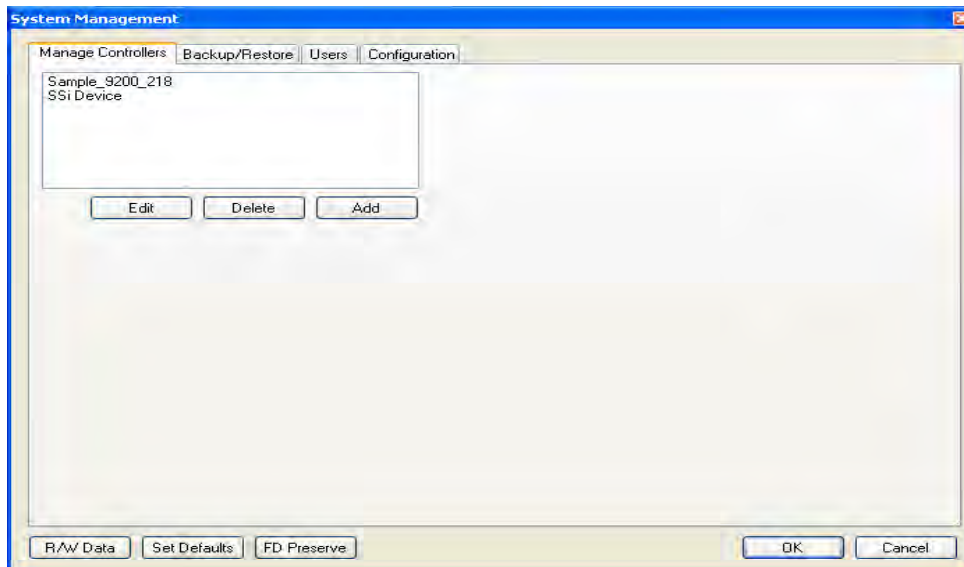
To login as Supervisor, enter "Supervisor" as the user name and enter the level 1 passcode as the password. The user name is not case-sensitive. If the login is successful, the login button will show  (gold). To login as Administrator, enter "Administrator" as the user name and enter the level 2 passcode as the password. The user name is not case-sensitive. If the login is successful, the

login button will show  (green). The SSi Special level is only used at Super Systems Inc for configuration of the device and the password can only be obtained from Super Systems. To login as SSi Special, enter the pass code as the password. **No username is required for the SSi Special level.** If the login is successful, the login button will show  (red).

3. The Show Overview Display button

4. The System Settings button

The system settings button, , is only available to those users who have a Supervisor level access or higher. The systems settings feature allows the user to manage any controller(s) and also backup/restore any controller(s).



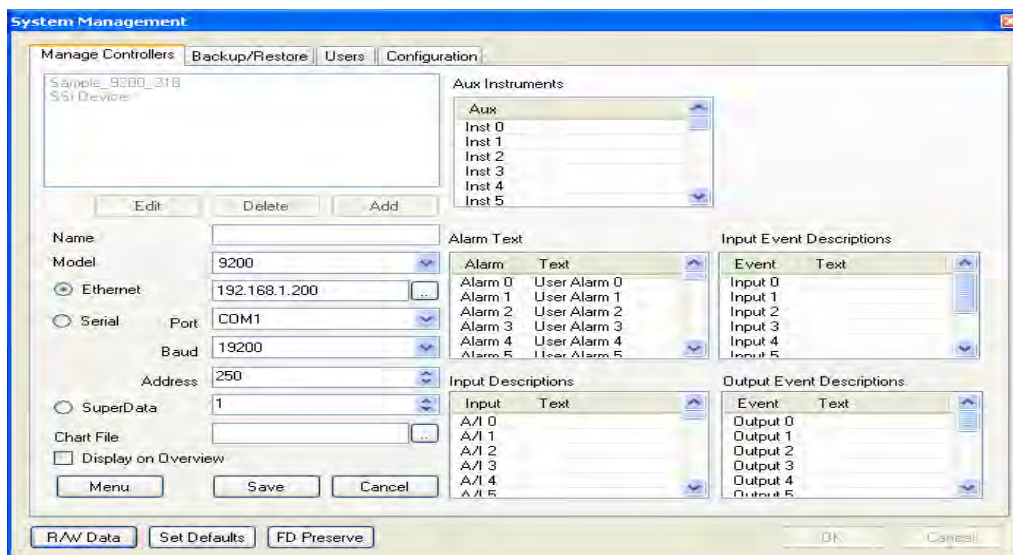
Configurator Manage Controllers display

Manage Controllers Tab

The list box at the top of the form shows any controller setup that is currently stored in the Configurator. The user can edit, add, or delete a controller setup from the Configurator.

Add a Controller


First, click on the “Add” button under the controller list.

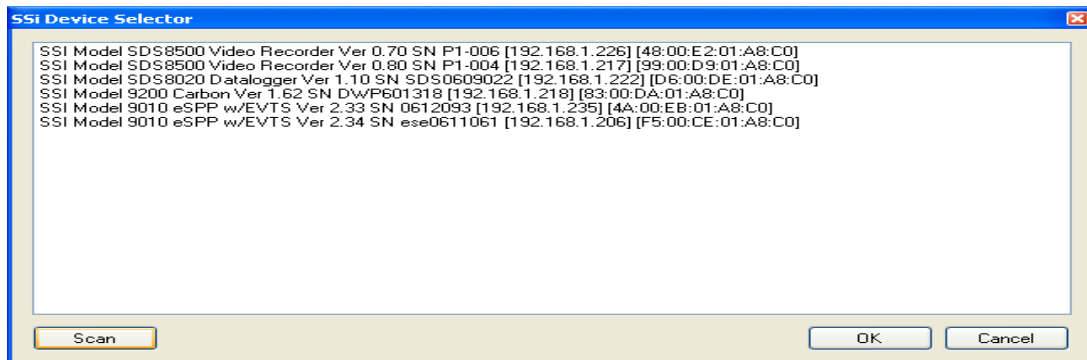


Configurator Add/Edit Controller section

The “Name” is the name the user wishes to give the controller. This is how the Configurator will refer to this controller throughout.

The “Controller Type” is a drop-down list of all of the available controller types (9005, 9200, 9220, etc). This refers to what kind of controller you are adding.

The "Ethernet" option specifies the IP Address of the controller. Clicking on the **scan** button next to the text box, , will allow the user to scan the network for all available devices with the *SSi Device Selector* screen.




Configurator – SSi Device Selector

Clicking on the **Scan** button will initiate the scan procedure. Please note that this scan could take a few minutes. Once the scan has completed, the list of available devices will be displayed. Clicking on one of the devices will highlight that line in **blue**. Clicking on the **OK** button once a device has been selected will set that device's IP address in the Ethernet IP address textbox. Clicking on the **Cancel** button will cancel the process and close down the *SSi Device Selector* screen.

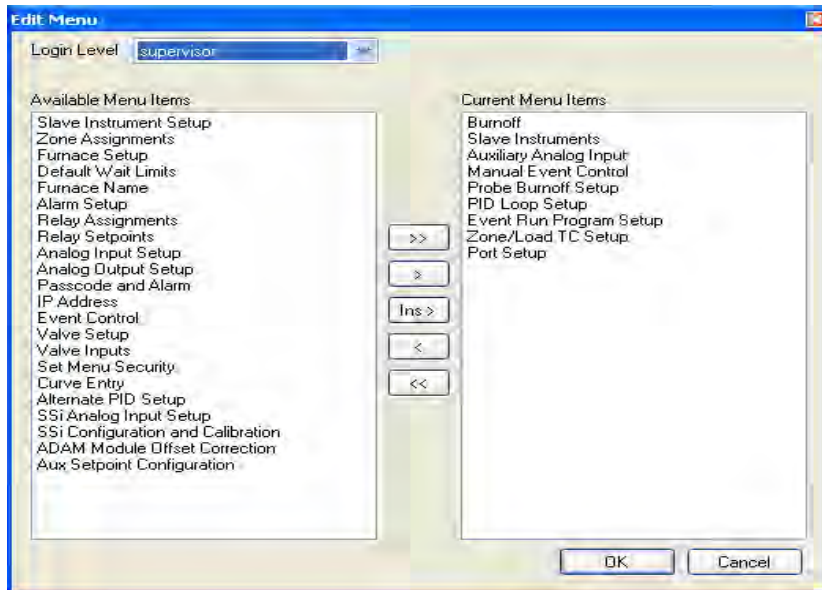
The "Serial" option specifies the "Com Port" (COM1 – COM20), the "Baud" rate (1200 – 115200), and the "Address" (0 – 250).

The "SuperData" option specifies the channel for SuperData (1 – 128).






The "Chart File" specifies the chart file (.ctm) to be used. Clicking on the **open** button, , will display a Windows open file dialog box that will allow the user to navigate to the proper location, if necessary.

Check the checkbox next to "Display on overview" if you want to display this on the *Overview Display* screen.

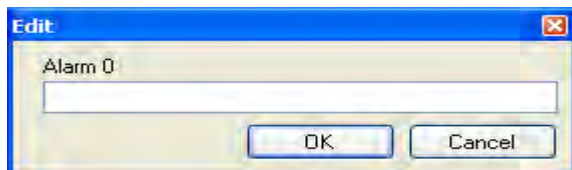
Clicking on the **Menu** button will allow the user to set up the menu options for each access level.



Configurator – Edit Menu screen

Use the drop-down list at the top of the form to select the access level to change. The list on the right of the screen is the current menu list for the specific access level. The list on the left of the screen lists the remaining items. To add a menu option, select the desired menu option on the left and click on the **Add** button, . To add all of the menu options at once, click on the **Add All** button, . To remove a menu option, select the desired menu option on the right and click on the **Remove** button, . To remove all of the menu options at once, click on the **Remove All** button, . To add a menu option to a specific position, click on the menu option on the right where the new option will be inserted, click on the menu option on the left to add and click on the **Insert** button, . Click the **OK** button to accept the changes or the **Cancel** button to close the form without accepting the changes. Clicking on the **Save** button will save the changes, while clicking on the **Cancel** button will cancel the action.

The right side of the form displays the Aux Instruments and the text for those instruments, Alarms and the text for those alarms, Input Event Descriptions and the text for those descriptions, Input Descriptions and the text for those descriptions, and the Output Event Descriptions and the text for those descriptions. To change the text, double-click on the specific item to change. The Configurator will display an input box that will allow the user to change the current text value.



Configurator – Edit text input box

Clicking **OK** will change the text value, and clicking **Cancel** will not change the text value.

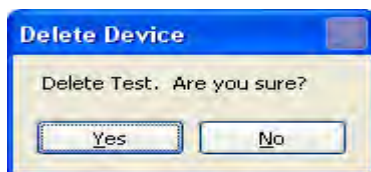
To save these changes and add the controller, click the **Save** button. Click on the **Cancel** button if this controller is not to be added. The bottom section of the form will become invisible again.

Edit a Controller

Double-click on the specific controller that is to be modified, or single-click on the controller and click the **Edit** button to begin editing. Change the necessary values, then click on the **Save** button to save the changes or click on the **Cancel** button to cancel this operation. See the above section *Add a Controller* for a description of the different fields.

Delete a Controller

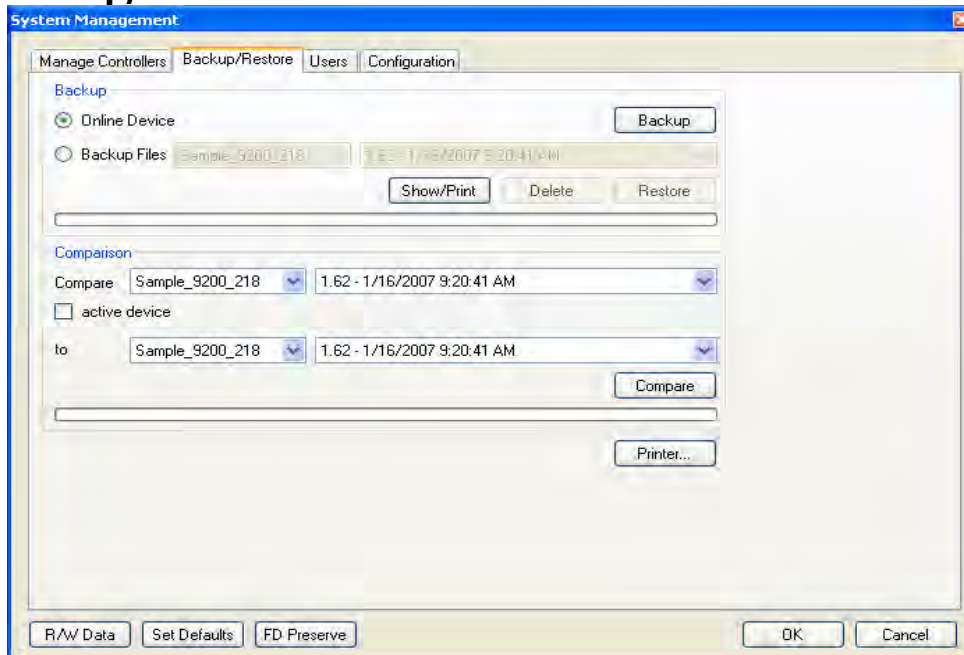
Click on the specific controller that is to be deleted. Click on the **Delete** button to delete this controller. The Configurator will display a message box asking the user to confirm the delete.



Configurator – Confirm Delete Device

Clicking on the **Yes** button will delete the controller. Clicking on the **No** button will cancel the delete.

Backup/Restore Tab

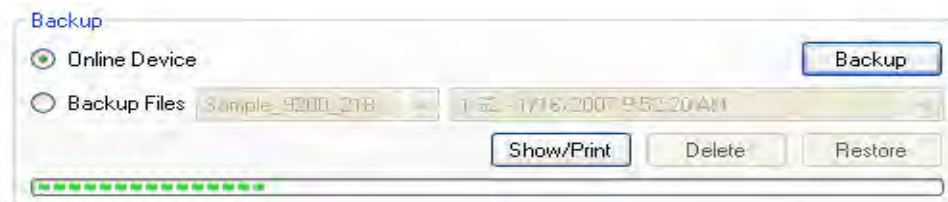


Configurator Backup/Restore Display

The Backup/Restore display allows the user to create a backup of a controller configuration, or restore a controller to a previous configuration.

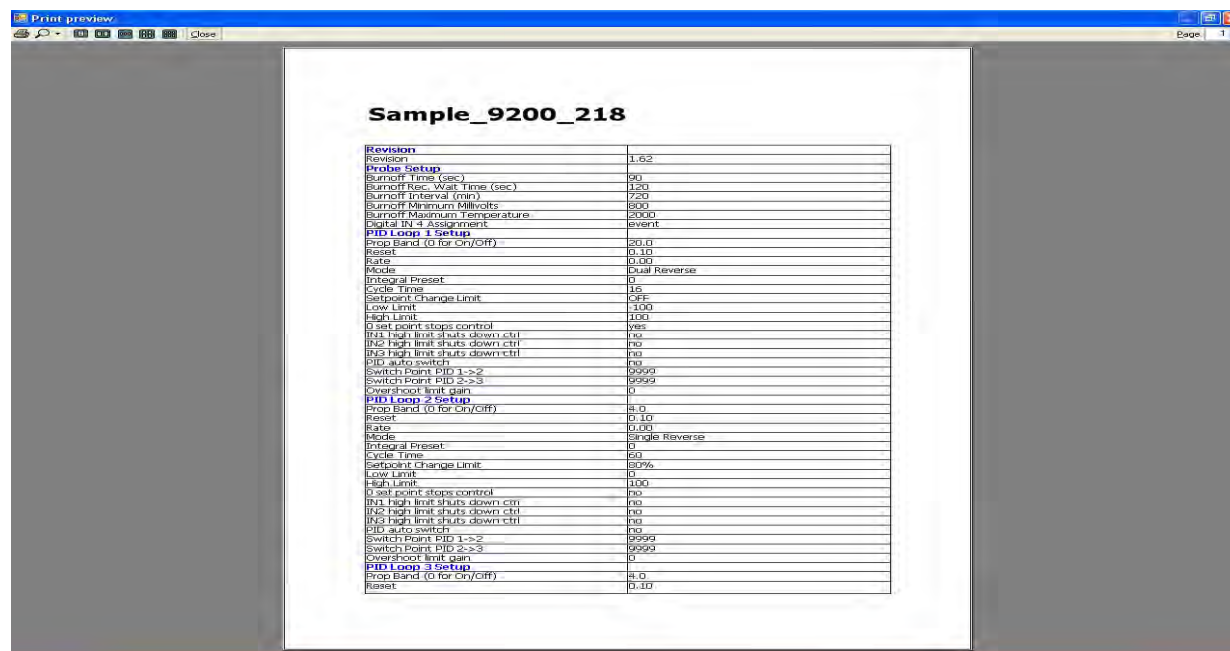
Backup Section

This area will allow the user to either backup the current controller, or restore the current controller to a previous configuration. **Note: The user must be connected to a device before being able to backup or restore a configuration.** Selecting the "Online Device" option will allow the user to backup the controller. Once this section is selected, the **Delete** and **Restore** buttons will become disabled, as well as the drop-down lists for the "Backup Files" section, as they deal only with backed-up configuration files. Clicking on the **Backup** button will backup the current configuration. The progress bar at the bottom of the section will update the backup progress.




Configurator – Backup Section with progress

The **Show/Print** button will display a print preview with the current controller's configuration.

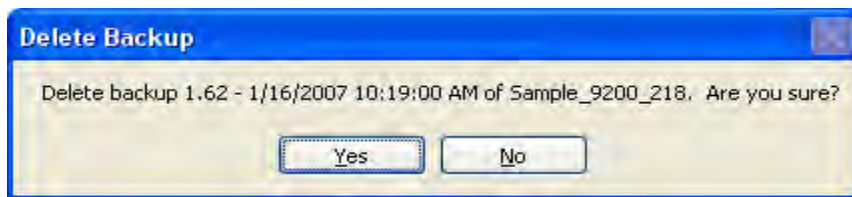


Configurator – Print Preview screen

From this screen, the user can either print out the configuration by clicking on the printer icon, , or close the print preview by clicking on the **Close** button or the close button on the top

right of the screen, .

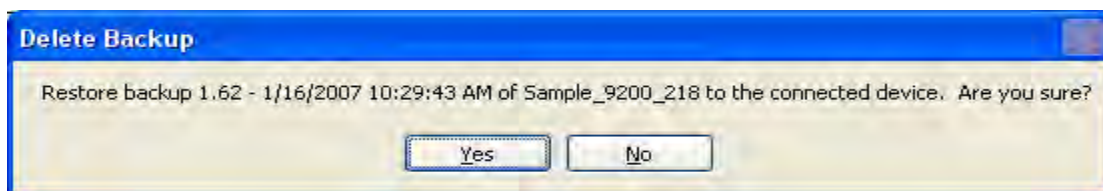
Selecting the "Backup Files" option will allow the user to manage the backup configurations on the local computer. When this option is selected, the **Backup** button will become disabled. The **Delete** button will delete the selected configuration. The user must confirm the delete first.



Configurator – Confirm Delete Backup file

Clicking on the **Yes** button will delete the configuration, but clicking on the **No** button will cancel the delete.

Clicking on the **Restore** button will restore a backup configuration to the connected device. The user must confirm the restoration.



Configurator – Confirm Restore backup

Clicking on the **Yes** button will restore the selected configuration file, but clicking on the **No** button will cancel the restoration. The progress bar at the bottom of the section will update the restore progress.

Comparison Section

The Comparison section allows the user to compare two backup files to each other. **Note: The user must be connected to a controller if he/she wishes to use the active device for comparison.** If the user wishes to use the device the Configurator is connected to, the user can check the “Active Device” check box. This will disable the top two drop-down lists.



Configurator Compare section with “Active Device” checked

To compare a specific file with another, do not check the “Active Device” checkbox. If this checkbox is not checked, then all four drop-down lists will be enabled. The user can then select the device from the first drop-down list and the specific file for the comparison from the second drop-down list. The user can select the device where the file to compare to is from the third drop-down list, and the file to compare to can be selected from the fourth drop-down list. Once all of the necessary information has been setup, the user can click the **Compare** button. The progress bar at the bottom of the section will update the comparison. If the devices are identical, the Configurator will display a message box.



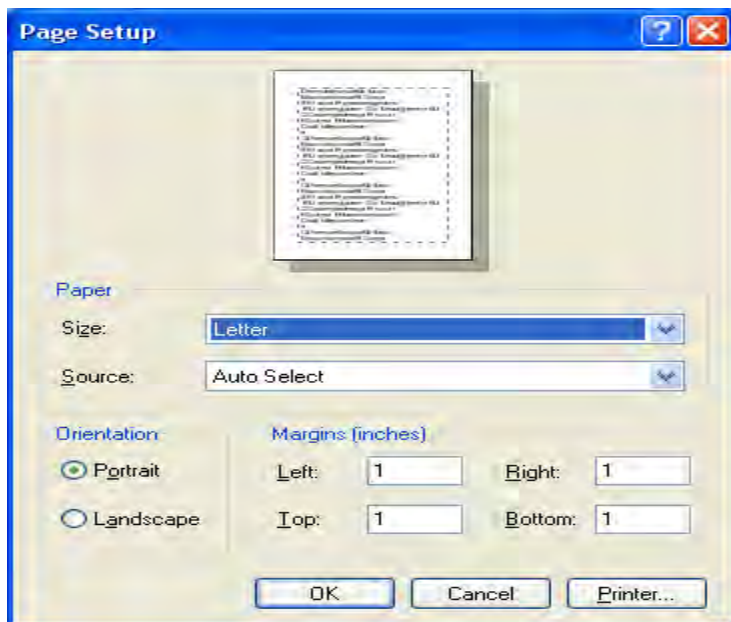
Configurator – Devices are identical message box

If the devices are different, the Configurator will display a print preview with the first device's values and properties printed in **red**, and the second device's values and properties printed in **blue**.

	Sample_9200_218 - 1.62 - 1/16/2007 10:29:43 AM	Sample2_9200_98 - 1.64 - 1/16/2007 10:48:26 AM
[Revision] Revision	1.62	1.64
[PID Loop 2 Setup] Mode	Single Reverse	Single Reverse
[PID Loop 2 Setup] Setpoint Change Limit	50%	50%
[PID Loop 2 Setup] 0 set point stops control	no	Single Reverse
[PID Loop 2 Setup] IN1 high limit shuts down ctrl	no	Single Reverse
[PID Loop 2 Setup] IN2 high limit shuts down ctrl	no	Single Reverse
[PID Loop 2 Setup] IN3 high limit shuts down ctrl	no	Single Reverse
[PID Loop 2 Setup] PID auto switch	no	Single Reverse
[Slave Instrument Setup] Instrument 1		
[Furnace Name] Furnace Name	Batch 1 3SY NY	Batch 1 Y Y*
[IP Address] IP Address 4	218	98
[Curve 1 Entry] Curve Type	none	none
[Curve 1 Entry] Control Range	29225	17916
[Curve 1 Entry] mV 1	25974	167
[Curve 1 Entry] Vac 1	3180	10755
[Curve 1 Entry] mV 2	16640	22314
[Curve 1 Entry] Vac 2	16896	178
[Curve 1 Entry] mV 3	1	19188
[Curve 1 Entry] Vac 3	8072	768
[Curve 1 Entry] mV 4	14892	19414
[Curve 1 Entry] Vac 4	14848	768
[Curve 1 Entry] mV 5	12	3346
[Curve 1 Entry] Vac 5	83	182
[Curve 1 Entry] mV 6	820	-26354

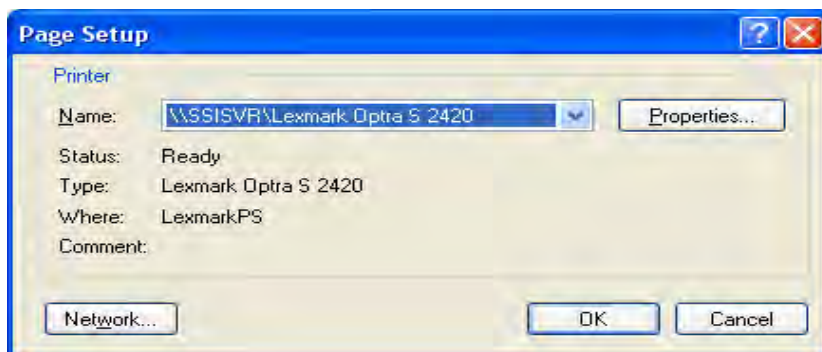
Configurator – Print Preview with different files

The **Printer...** button will allow the user to select page setup information for the printed documents. **Note: The printer settings are set to their defaults whenever Configurator loads. Any setting changes made through this button will not be saved.**



Configurator – Printer page setup screen

The user will be able to select the size and source of the paper, the orientation of the printed material, and the margins for the printed material. Clicking on the **OK** button will set the page settings. Clicking on the **Cancel** button will cancel the setup process. Clicking on the **Printer...** button will allow the user to select the printer to send the information to.

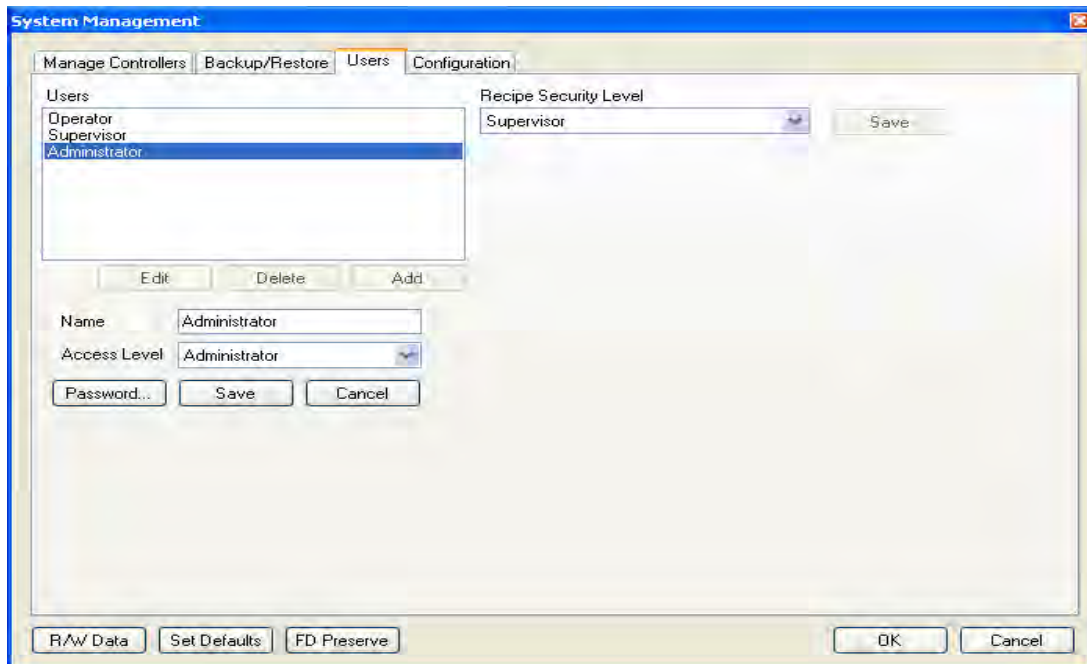


Configurator – Select Printer screen

The user will be able to select the appropriate printer from the drop-down list. Clicking on the **Properties...** button will display the properties for the selected printer. Clicking on the **Network** button will allow the user to search through the local network for a printer. Clicking the **OK** button will set the selected printer. Clicking the **Cancel** button will cancel the printer selection.

Users Tab

The Users tab allows the user to modify the user settings for any user on Configurator.



Configurator – Users tab with Administrator User info

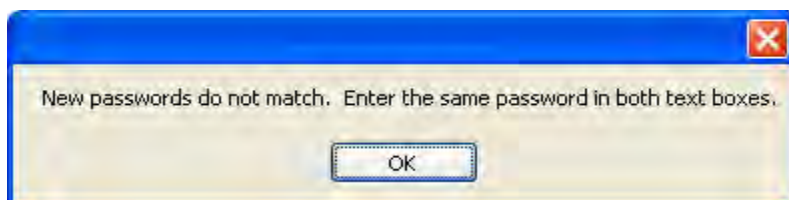
The default three users within Configurator are: Operator, Supervisor, and Administrator.

Add a User

To add a user, click on the **Add** button. This will display the user fields: Name, Access Level, **Password...** button, **Save** button, and **Cancel** button. Enter the name of the user and select the appropriate access level. To set a password, click on the **Password...** button. A password does not have to be given to add a user. The password fields are displayed: New Password, Retype New Password, **Save** button, and **Cancel** button. The user can type in the password in the "New Password" and "Retype New Password" fields. Clicking on the **Save** button will save the password, and clicking on the **Cancel** button will cancel the password add.

Configurator – Add User Password fields

If the passwords do not match, then Configurator will display an error message.



Configurator – Passwords do not match error message

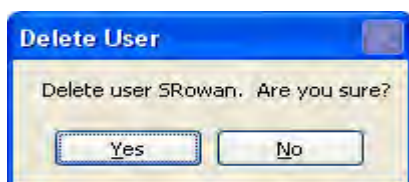
Clicking on the **Save** button will save the user and add the user name to the list. Clicking on the **Cancel** button will cancel the add user process and hide the user fields.

Edit a User

To edit a user's settings, select a user from the list and click on the **Edit** button, or double-click on the user name in the list. This will display the user fields. The rules for adding a user apply to editing a user as well. See the section *Add a User* for instructions.

Delete a User

To delete a user, select a user from the list and click on the **Delete** button. The user will have to confirm the deletion.



Configurator – Confirm delete user

Clicking on the **Yes** button will delete the user, and clicking on the **No** button will cancel the delete process. Once a user has been deleted, the list of users will update.

The Recipe Security Level will determine what level of recipe security the users will have. Once the user has selected a different level, the **Save** button will have a red background.

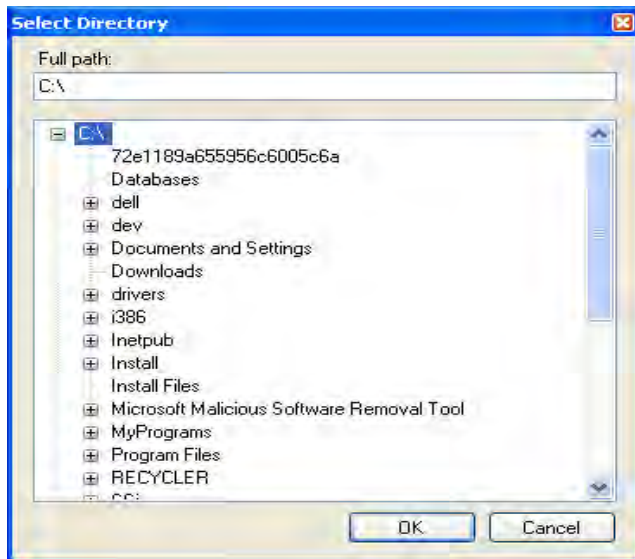


Configurator – Change User Recipe Security Level

Clicking on the **Save** button will save the new recipe security level.

Configuration Tab

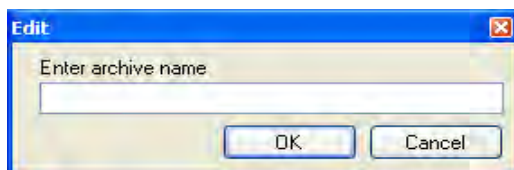
The Configuration tab will allow the user to change the configuration of Configurator. The "Data Access" section displays the location for all of the data files that Configurator uses, such as backup files, user configurations, etc. To change this location, click on the **Change** button. This will display a dialog box that will allow the user to browse and select a new location.



Configurator – Select Directory dialog box

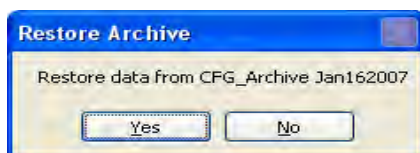
The user can browse to a new location and click on the **OK** button to set that location as the new location. Clicking on the **Cancel** button will cancel the change. **Note: The main Configurator files (Configurator.exe, SSIlibrary.dll, etc) do not need to be in the same directory as the data files.**

The “Configurator Settings” section deals with Configurator’s screen size. The **Restore** button will restore Configurator’s screen size to the default size. The list below the **Restore** button will display any archived configurations. To archive a configuration, click on the **Archive** button. The user will have to give the archive a name.



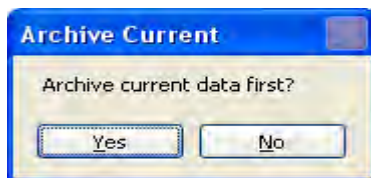
Configurator – Archive Name input box

Clicking on the **OK** button after inputting a name will archive the configuration settings and update the list. Clicking on the **Cancel** button will cancel the archival process. Clicking on the **OK** button without giving an archive name will stop the archive process. To restore an archived configuration, select the configuration from the list and click on the **Restore** button. The user will have to confirm the restoration.



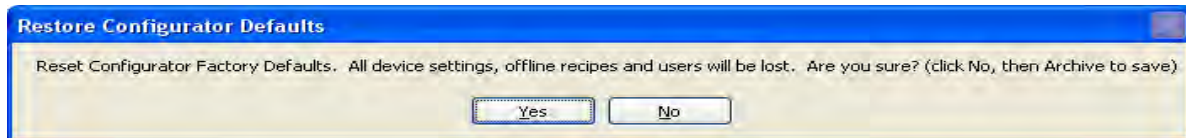
Configurator – Confirm restore archive

Clicking on the **Yes** button will restore the archive, while clicking on the **No** button will cancel the restore process. The user will have the option to archive the current settings before restoring the configuration settings.



Configurator – Archive Settings message box

Clicking on the **Defaults** button will restore all default values to Configurator. Since some data may be lost, the user will have to confirm the action.



Configurator – Restore defaults

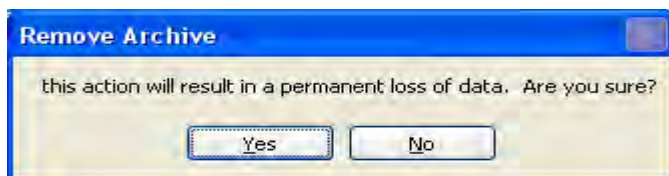
Clicking on the **Yes** button will restore the defaults, but clicking on the **No** button will cancel the restoration.

To remove a configuration from Configurator, select the configuration to remove and click on the **Remove** button. The user will have to confirm the removal.



Configurator – Confirm Remove Archive

Clicking on the **Yes** button will continue with the removal, while clicking on the **No** button will cancel the removal. Since removing the archived configuration will result in the loss of data, the user will have to confirm the removal a second time.



Configurator – Second Confirm Removal

Clicking on the **Yes** button will remove the archived file, while clicking on the **No** button will cancel the removal.

R/W Data

The **R/W Data** button will display the raw data from the selected controller.

Read/Write Raw Data

Read Offset: 0

	0	10	20	30	40	50	60	70	80	90
0	162	1	0	0	15	1229	0	0	0	10
1	5	3475	8	0	11	40	0	0	0	9
2	1	0	8	0	1	10	90	200	0	15
3	5	0	0	0	1400	0	120	0	1	10
4	1	1	10000	0	8	60	720	0	2	0
5	5	0	0	0	1	0	800	0	0	1
6	1	17	4	6	200	40	2000	0	1	0
7	2	8	8	10	10	10	5	2000	26	2
8	1	0	0	3	0	0	0	-1	7	0
9	5	1000	10000	1	16	60	200	-1	8	0

Multi-word Write

Write Offset: 0

Value boxes: 0, 0, 0, 0, 0

Buttons: Write, Done

Configurator – Read/Write Raw Data screen

The user must use the SSi Special passcode to access the R/W Data screen. Values can be written directly to the controller through this screen. Select the Modbus Read Offset value to start reading data. Select the Modbus Write Offset write data to a specific Modbus register. Configurator allows the user to write multiple words to sequential Modbus registers. Starting from the Modbus register provided, any of the value boxes that do not have the “disable” checkbox checked will write the value indicated to the sequential Modbus register. The top row contains registers 1 through 5 and the bottom row contains registers 6 through 10. The screen shot below shows how this process works.

Read/Write Raw Data

Read Offset: 600

	600	610	620	630	640	650	660	670	680	690
0	0	1	0	0	0	0	-32768	-32768	-32768	-32768
1	0	2	0	0	0	0	-32768	10	-32768	-32768
2	0	3	0	0	0	0	-32768	-32768	-32768	-32768
3	0	4	0	0	0	0	-32768	-32768	-32768	-32768
4	0	5	0	0	0	0	-32768	-32768	-32768	-32768
5	0	6	0	0	0	0	0	-32768	-32768	-32768
6	0	7	0	0	0	0	-32768	-32768	-32768	-32768
7	0	8	0	0	0	0	-32768	0	-32768	-32768
8	-32768	9	0	0	0	0	-32768	-32768	-32768	-32768
9	-32768	10	0	0	0	0	-32768	-32768	-32768	-32768

Multi-word Write

Write Offset: 610

Value boxes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

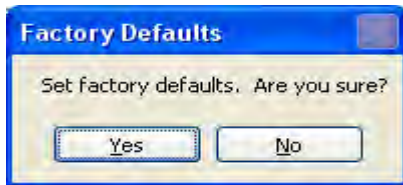
Buttons: Write, Done

Configurator – Write multi-word offsets

Since the “Write Offset” field was set to **610**, this is the starting point for the write. Clicking on the **Done** button will close out the Read/Write Raw Data screen.

Set Factory Defaults

Clicking on the **Set Defaults** button will set the factory defaults for Configurator. The user will have to confirm this action.

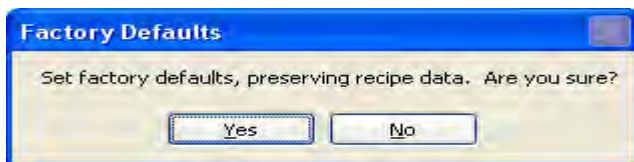


Configurator – Set factory defaults confirmation

Clicking on the **Yes** button will set the factory defaults; clicking on the **No** button will cancel the action.

FD Preserve

The **FD Preserve** button will set the factory defaults while also preserving the recipe information. The user will have to confirm the action.



Configurator – Confirm set factory defaults with recipe preserve

Clicking on the **Yes** button will set the factory defaults and preserve the recipe information.

Clicking on the **No** button will cancel the action.

Clicking on the **OK** or **Cancel** button will close the *System Management* screen.

5. The Recipe Editor button

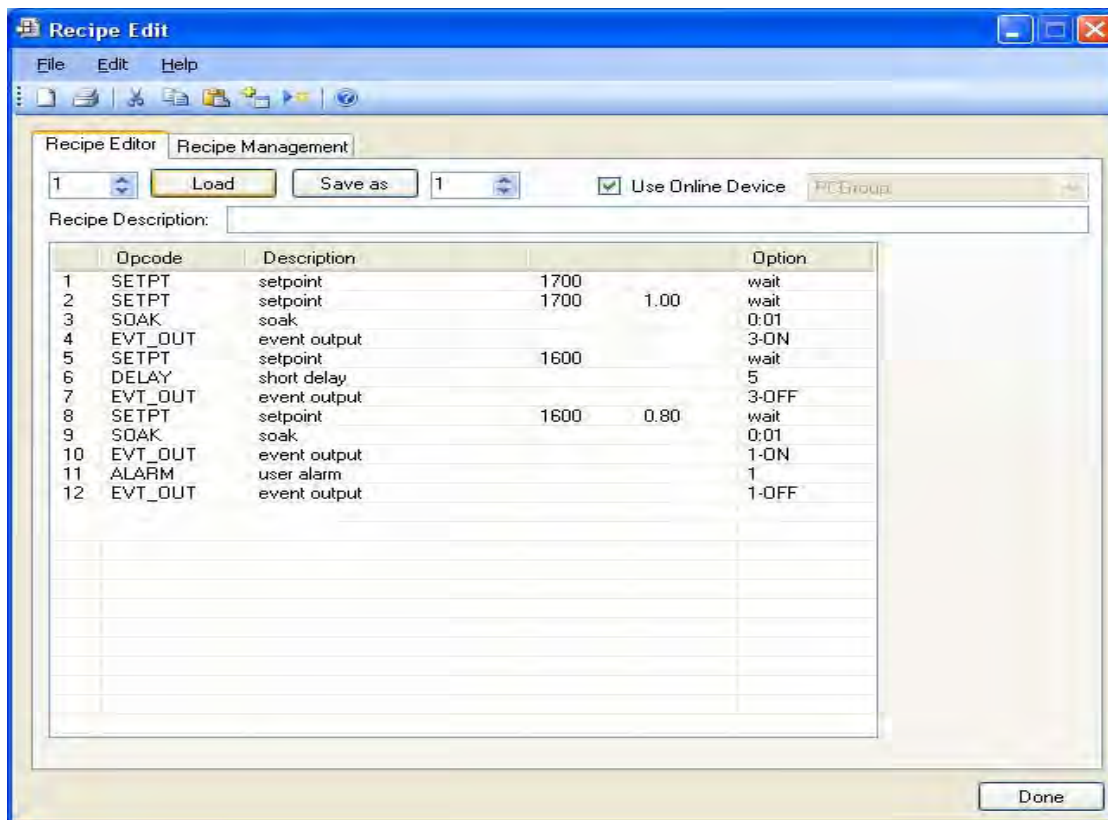
The Recipe Editor button is available to users of all access levels, however, users with Operator-level access cannot save recipes. This form allows users to manually edit a recipe.

The toolbar at the top of the form contains the basic Windows-type functions, new, cut, copy, etc. The Windows-type shortcuts apply to most of the functions as well: Ctrl + C to copy, Ctrl + X to cut, etc. The menu will list the shortcut next to each command.



Configurator – Recipe Edit toolbar

From left to right are: New (load a blank recipe), Print (print out the recipe steps), Cut (cut a selected step), Copy (copy a selected step), Paste (paste the cut or copied step), Insert Step (inserts a selected step into the program...all steps below the inserted step will move down), Insert NO-OP Step (insert a NO-OP step into the program...all steps below the inserted step will move down), and Help (display a help page).



Configurator Recipe Editor screen

Recipe Editor Tab

Load/Save Recipes

The box in the top left of the form is where the user can select which recipe (0 – 300) to load. Use the up or down arrows, or just type in the recipe number and click on the **Load** button. The recipe steps will be filled in the white area on the form. Once the **Load** button has been clicked, the box to the right of the **Save As** button will be filled with the recipe number selected. By default, the **Save As** recipe will be the same as the **Load** recipe. To save the loaded recipe as a different recipe number, use the up or down arrows, or just type in the new number (0 – 300) in the box next to the **Save As** button and click this button. Checking the “Use Online Device” check box will load and save the recipes on the currently connected controller. Not checking this check box will load and save the recipes on the local computer (PCGroup). The “Recipe Description” line is a text description of the recipe.

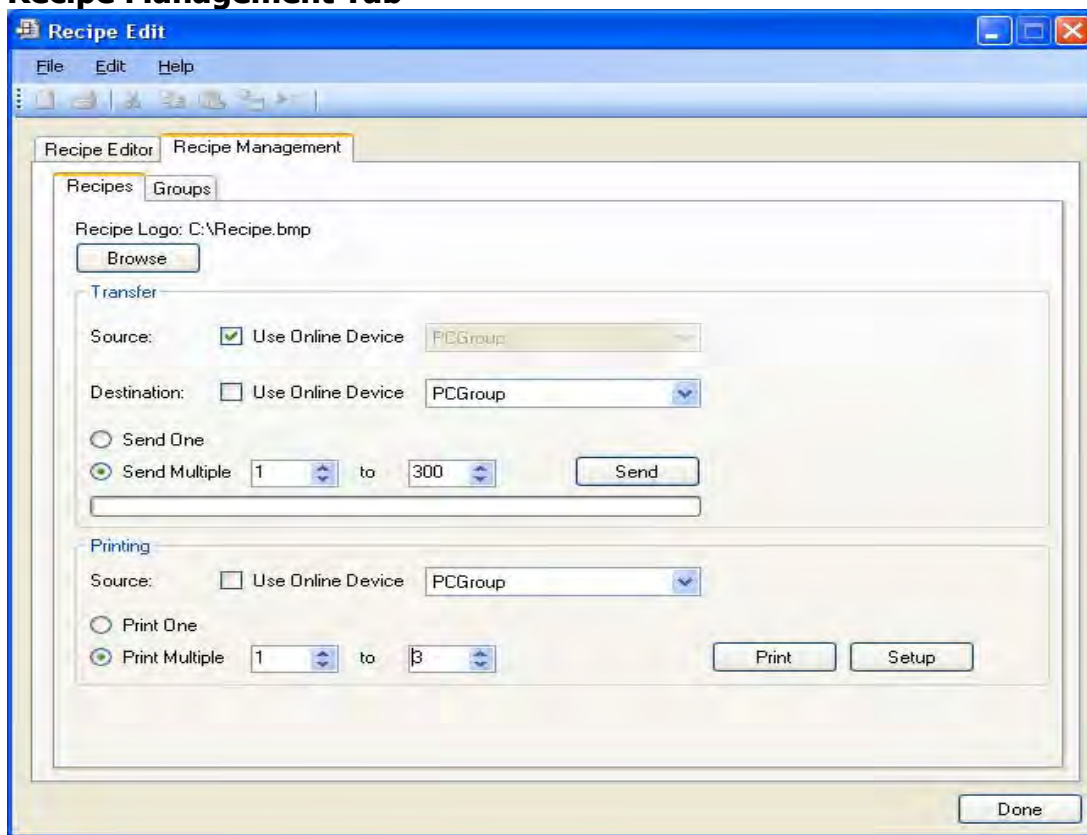
Modify Recipes

To modify any of the steps in the recipe, double-click on the row of the step that will be modified. This will display the *Edit Step* form.

Configurator Recipe Step Edit form

The drop-down list under "Opcode" allows the user to select the specific opcode that will be used in the recipe step. Checking the "Alphabetical" checkbox will allow the user to alphabetize the list. If a temperature value or an atmosphere value is needed, these can be set using the up or down arrows, or by just typing in the value. If these are not needed, check the "Disable" checkbox and the boxes will become unavailable. Note – for some opcodes, the display text will change and the *Edit Step* screen will look slightly different to accommodate the different types of values associated with each opcode, but the functionality of each item will remain the same. The box(es) on the right side of the form is the action or value that should be taken. For instance, with opcode "SetPt", the box on the right is the "Option" and there is a drop-down list of available options: wait, wait up, wait down. However, for opcode "soak", the temperature value and atmosphere value fields disappear and the boxes on the right of the form are "Soak Time hoursminutes", and there are two boxes that have values ranging from **0** to **1000** for the hours and **0** to **59** for the minutes. These values can be adjusted by using the up or down arrows, or by typing the new value in. The user can add an optional comment to the recipe step in the "Comment" field, if desired. Once all of the changes have been made, the user can click on **OK** to save these changes.

Recipe Management Tab



Configurator – Recipe Management tab with Recipes tab

Recipes Tab

The "Recipe Logo:" will allow the user to select a bitmap (.bmp) image to act as a logo for the recipes. Clicking on the **Browse** button will open up a dialog box that will allow the user to browse to the desired picture.

Transfer Section

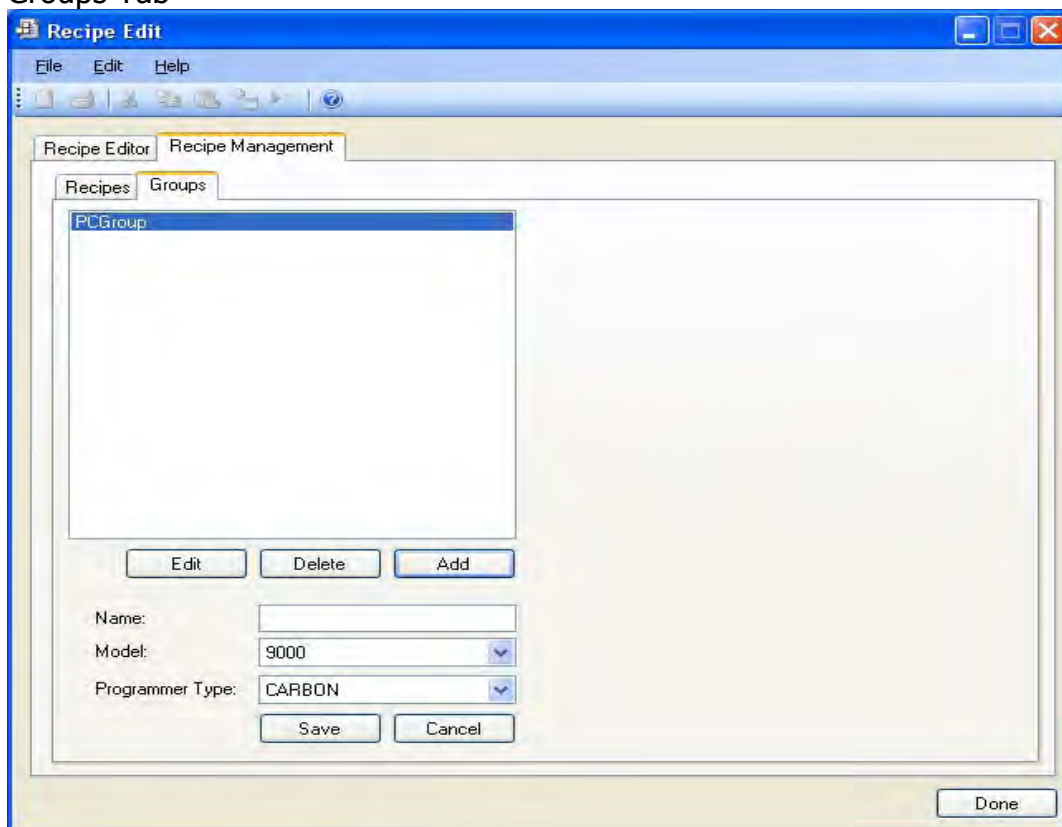
The Transfer section will allow the user to transfer one or more recipes from one location to another. The "Source" field could either be the currently connected device ("Use Online Device"), or one of the offline groups ("PCGroup"). The "Destination" field could either be the currently connected device ("Use Online Device"), or one of the offline groups ("PCGroup").

The "Send One" option will send only one recipe from the source to the destination. The recipe to send will be based upon the numeric value within the box next to the "Send Multiple" option. The "Send Multiple" option will send any number of sequential recipes from the source to the destination. When the "Send Multiple" option is selected, there will be another numeric value box visible next to the first numeric value box. This second box will be invisible when the "Send One" option is selected. Once all of the required information is present (source, destination, recipe to send), clicking on the **Send** button will send the recipes. The progress bar at the bottom of the section will update the send process. ***Note: Transferring recipes from or to a controller may take a few minutes.***

Printing Section

The Printing section allows the user the ability to print out recipes. The "Source" field could either be the currently connected device ("Use Online Device"), or one of the offline groups ("PCGroup"). The "Print One" option will print only one recipe from the source. The recipe to print will be based upon the numeric value within the box next to the "Print Multiple" option. The "Print Multiple" option will print any number of sequential recipes from the source. When the "Print Multiple" option is selected, there will be another numeric value box visible next to the first numeric value box. This second box will be invisible when the "Print One" option is selected. Clicking on the **Print** button will display a print preview dialog, where the user will be able to view and/or print the recipes. Clicking on the **Setup** button will display a *Page Setup* screen, which will allow the user to set up the page settings for printing, as well as select the printer. **Note: Printing recipes from a controller may take a few minutes.**

Groups Tab



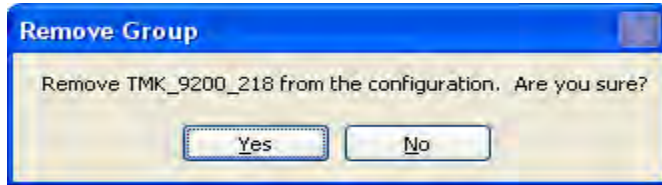
Configurator – Recipe Management tab with Groups tab

The Groups tab will allow the user to add, modify, or delete the offline groups of recipes. The offline recipe groups are used throughout the *Recipe Edit* screen, both on the Recipe Editor tab and the Recipe Management tab.

To add a recipe group, click on the **Add** button. This will display the recipe group fields: Name, Model, and Programmer Type. Enter or select the desired values and click the **Save** button to save the new group, or click the **Cancel** button to cancel the add process.

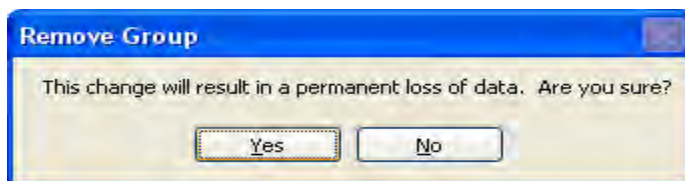
To edit a recipe group, click on the group name to edit from the list and click on the **Edit** buttons, or double-click the group name in the list. This will display the recipe group fields with

the selected recipe group's information loaded. Modify the desired values and then click the **Save** button to save the changes, or click on the **Cancel** button to cancel the edit process. To delete a recipe group name, click on the group name to delete and click on the **Delete** button. The user will have to confirm the delete.



Configurator – Confirm delete recipe group

Clicking on the **Yes** button will continue with the delete, while clicking on the **No** button will cancel the delete process. Since deleting a recipe group will result in the loss of data, the user will have to confirm the delete a second time.



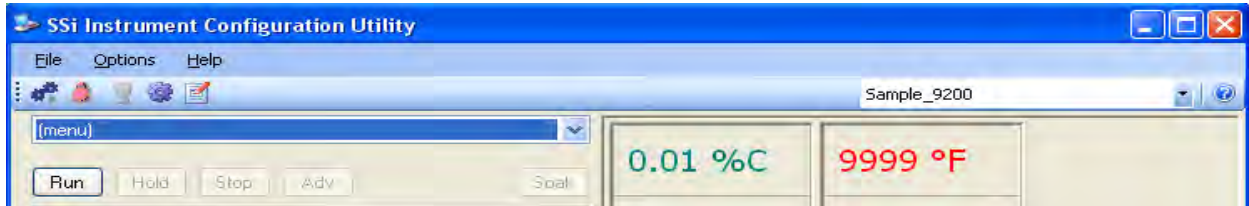
Configurator – Second confirm delete recipe group

Clicking on the **Yes** button will delete the recipe group, while clicking on the **No** button will cancel the delete process.

Clicking on the **Done** button will close the screen down.

Configurator Main Form

The right side of the form contains a drop-down list that contains all of the devices configured with the Configurator. To view a specific device, select it from the drop down list.

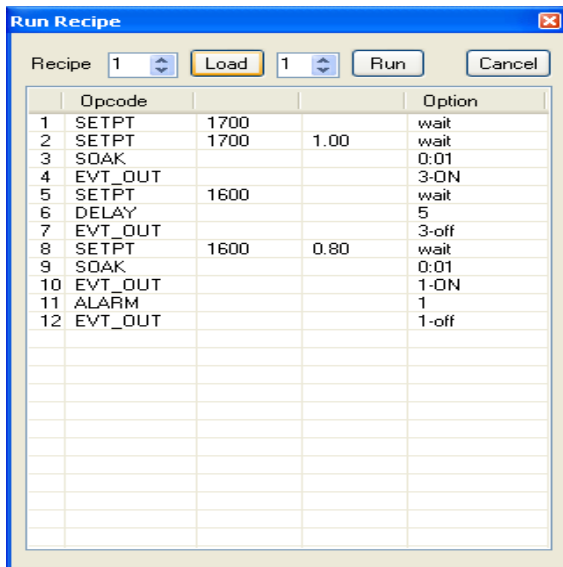


Configurator - Device drop-down list

The selected menu items on the left, and the values on the screen, will change to reflect the new device's values.

The area right below the drop-down menu list allows the user to start, stop, hold, or resume a recipe.

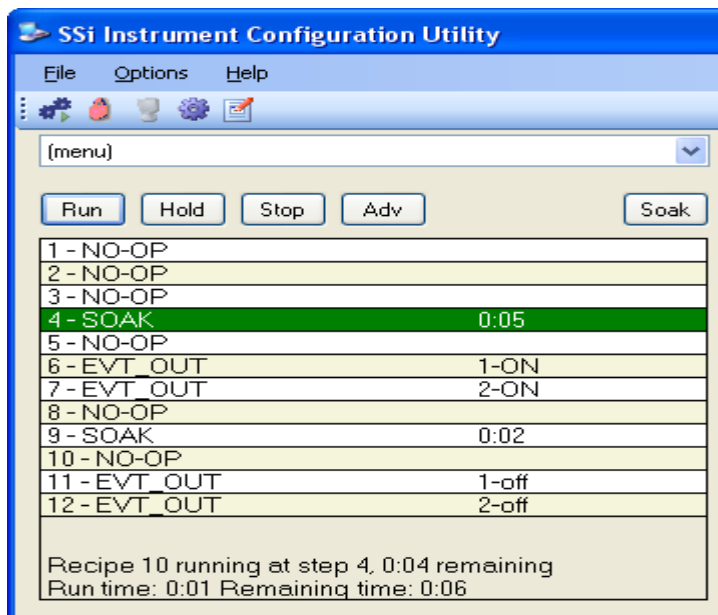
Clicking on the **Run** button will display the *Run Recipe* screen, from which the user can select the recipe to run.



Configurator – Run Recipe screen

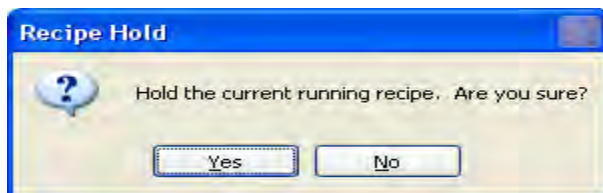
Use the number box next to the "Recipe:" to select a recipe number from **1** to **300**. Once the recipe number has been selected, click on the **Load** button. This will display the steps in the recipe in the white area. If the user wants the recipe to start from a step other than step 1, the user can select which step from the number box to the right of the **Load** button. The user can edit the steps in the recipe just like in the *Recipe Management* screen. Once the recipe number and the starting step number have been chosen, the user can click on the **Run** button. This will begin the recipe. If the user does not wish to run the recipe, clicking on the **Cancel** button will close the form without starting the recipe.

While a recipe is running, there will be a green highlight across the program display area.



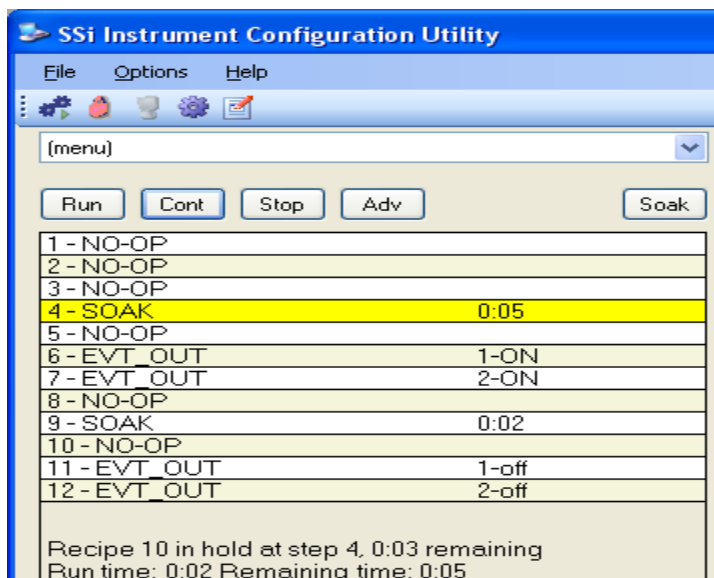
Configurator - Program running display

The **Hold** button will put the recipe on hold, but it will not stop the recipe. To hold a recipe, click on the **Hold** button. The user will have to confirm the action.



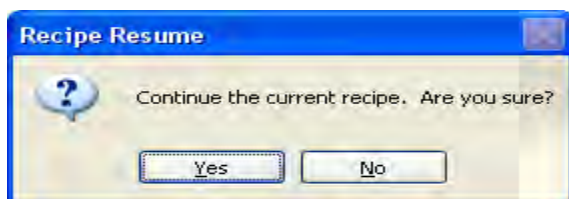
Configurator – Confirm hold recipe

Clicking on **Yes** will hold the recipe, and clicking on **No** will not hold the recipe. Once the program has been held, the **Hold** button will say **Cont**, there will be a yellow highlight across the program display.



Configurator – Program hold

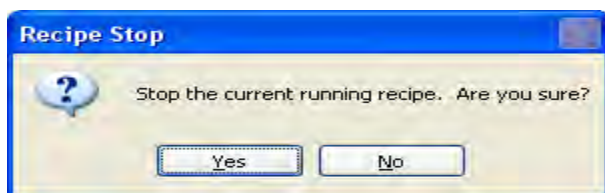
To continue the recipe, click on the **Cont** button. The user will have to confirm the action



Configurator – Confirm continue recipe

Click the **Yes** button to continue the recipe. Click the **No** button to leave the recipe in hold. Once the recipe has been continued, the green highlight will return and the **Cont** button will say **Hold**.

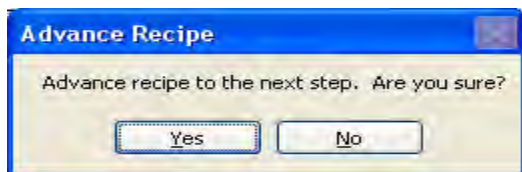
To stop the recipe, click on **Stop**. This will display a message box confirming the action.



Configurator – Confirm stop recipe

Clicking on **Yes** will stop the program and clicking on **No** will cancel the action.

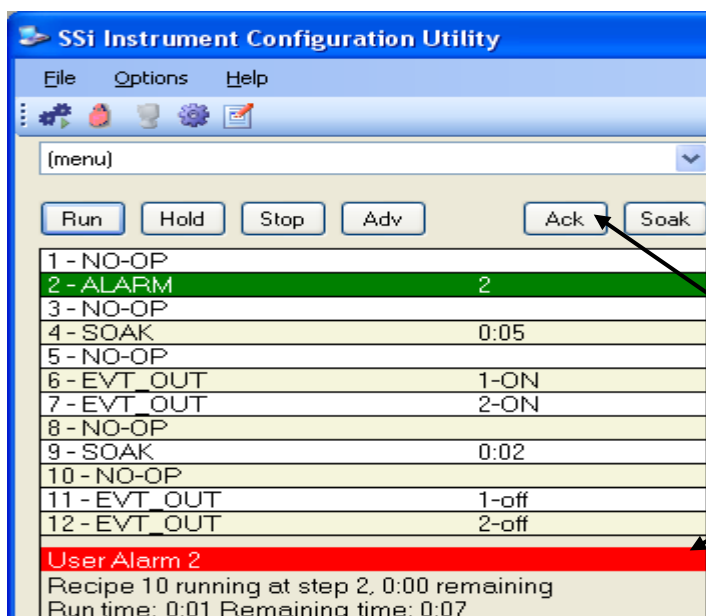
The **ADV** button will allow the user to advance to the next step in the recipe. The user will have to confirm the action.



Configurator – Confirm advance to the next step

Clicking on the **Yes** button will advance the recipe to the next step, while clicking on the **No** button will cancel the advance.

If there is an alarm of any kind, the alarm text will be displayed at the bottom of the program display area with a red highlight, and the **Ack** button will become visible.



Configurator – Program with alarm

Clicking on the **Ack** button will acknowledge the alarm. Once the alarm has been acknowledged, the **Ack** button will disappear, and the alarm text will disappear as well.

The **Soak** button will allow the user to manually change the length of a soak time. To do this, click on the **Soak** button. **Note: The recipe must be in a soak step for this button to be enabled.** This will display the Soak Timer dialog box.

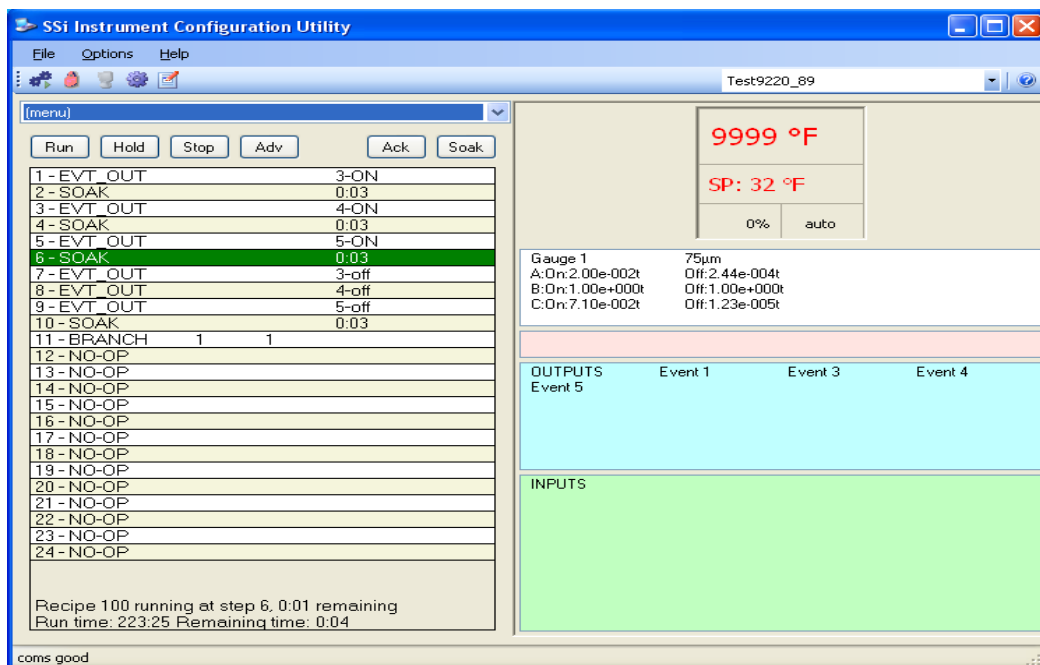


Configurator – Adjust soak time

The current soak time will be displayed initially. To set a new soak time, change the hours and/or minutes to the desired values and click on the **Set** button. **Note – This change will**

only last for the current soak and will not be a permanent change. To cancel the change, click on the **Cancel** button.

The right side of the screen contains the controller data: atmosphere actual and setpoint, temperature actual and setpoint, Probe information, Outputs, and Inputs.



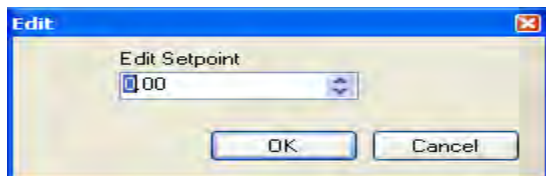
Configurator – Main screen with a recipe running

The first part is the atmosphere values and the temperature values



Configurator – Atmosphere and Temperature values

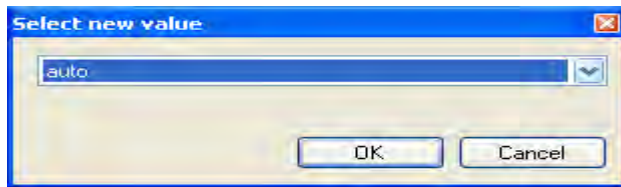
The left side is the atmosphere values. The first box contains the actual value of the atmosphere. The second box contains the atmosphere setpoint. Clicking on this box will allow the user to alter the setpoint.



Configurator – Edit atmosphere setpoint

Enter the new value or use the up and down arrows to select the new value and click on the **OK** button to set the new atmosphere setpoint. Clicking on the **Cancel** button will cancel the

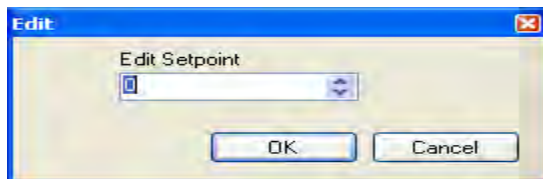
action. The bottom two boxes deal with the output values. Clicking on the bottom right box will allow the user to change the value.



Configurator – Edit atmosphere value

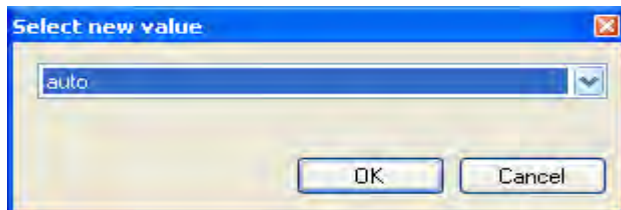
Select the new value, either "auto" or "manual", and click on the **OK** button to change the value, or click on the **Cancel** button to cancel the action.

The right side is the temperature values. The first box contains the actual value of the temperature. The second box contains the temperature setpoint. Clicking on this box will allow the user to alter the setpoint.



Configurator – Edit temperature setpoint

Enter the new value or use the up and down arrows to select the new value and click on the **OK** button to set the new temperature setpoint. Clicking on the **Cancel** button will cancel the action. The bottom two boxes deal with the output values. Clicking on the bottom right box will allow the user to change the value.



Configurator – Edit atmosphere value

Select the new value, either "auto" or "manual", and click on the **OK** button to change the value, or click on the **Cancel** button to cancel the action.

The next three boxes deal with the probe information, outputs and inputs, and these values cannot be edited by the user.

9200 Firmware Upgrade Procedure

Overview

The series 9200 firmware may require upgrades as determined by Super Systems Inc. These upgrades can be performed at SSI or they may also be performed at your facility while in use. The series 9200 will not maintain control of your system while this upgrade takes place and all precautions must be taken prior to beginning this procedure.

Equipment Required

- A PC with an Ethernet port and a cross over cable
- The Super Systems Configurator software
- The LocateIP software
- The Serial Number Utility software
- The UDP Download software
- A PC with an Ethernet port and a crossover cable is required. The Super Systems Configurator software, the LocateIP software, the Serial Number Utility software and the UDP Download software are all required.

Instructions

1 – Go To, or start, the Configurator program on your PC.

2 - The Configurator has a toolbar menu in the upper left. From left to right the icons will be referred to as:


A) Connect ()


B) Login ()

C) Show Overview Display ()


D) System Settings ()

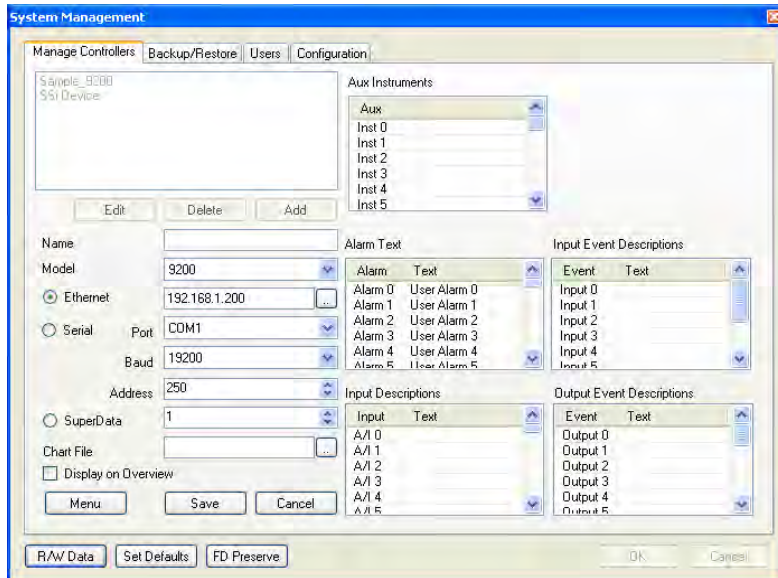
E) Edit Recipes ()

3 - Click the Login icon ()

Enter the password obtained from Super Systems Inc. for that day into the "Password" text box on the login form. *No username is required when logging in as SSI Special.* Click on the "OK" button. If the login was successful, the lock will change to a red lock ().


NOTE: If you have only one (1) 9200 previously connected and running you can "SKIP" Steps No. 4, 5, 6, 7, 8 & 9.

4 - Click the System Settings icon (), then click the "Add" button. This will display the System Management form.



Configurator - System Management form

5 - Use the drop-down menu next to "Model" to select "9200"

6 - Verify that the "Ethernet" address matches exactly the address of the controller being upgraded, or click on the scan button -  - to find the device.


7 - Enter the name of the device next to "Name", then click the **Save** button.

8 - Click the **OK** button. This will return the user back to the main form.

9 - On the upper right corner there will be a drop-down menu. Select the controller that needs to be upgraded. *Controllers that were recently added will be at the bottom of the list.*

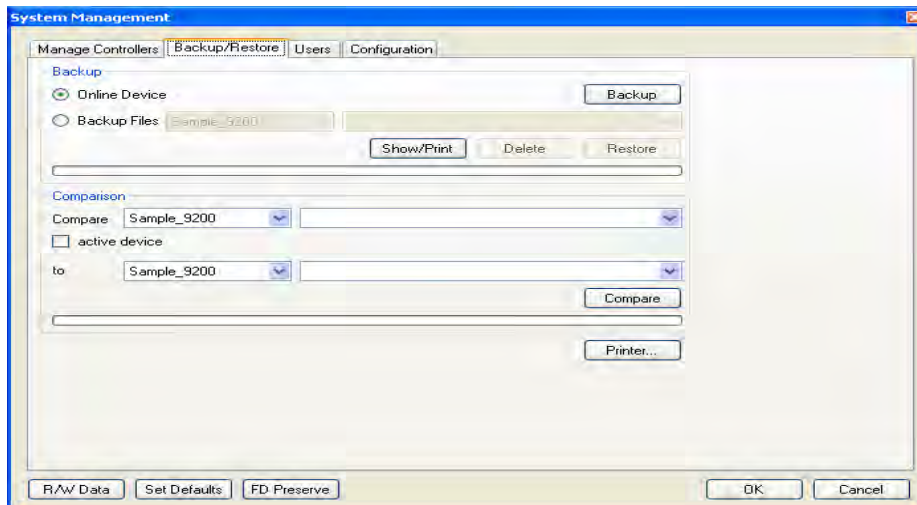


Configurator drop-down menu for the controllers

10 - Click the Connect icon () and verify after a few seconds that the communications (COMS) link is "Good" by looking in the bottom left corner of the main screen. You cannot proceed until the COMS are "Good".

11 - Click the System Settings icon ().


12 - Click on the "Backup/Restore" tab at the top of the screen



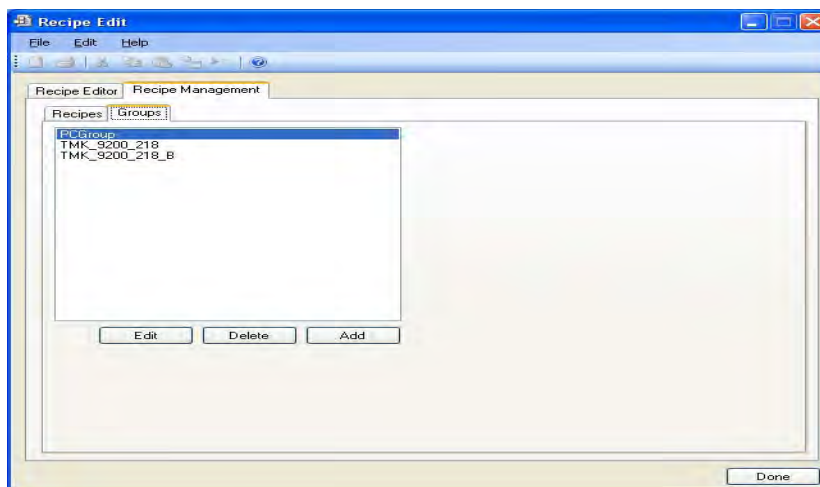
Configurator Backup/Restore tab

13 – Make sure the “Online Device” option is selected, then click on the **Backup** button. *The user must wait until the system finishes before attempting to navigate to another page or click on any other item.* When finished, the user will notice that when selecting the current controller in the “Backup” section, there will be a backup file with the firmware version and the date and time the backup was completed.

14 – Click the **OK** button in the bottom right corner of the screen to close the screen out.

15 – On the main form, click on the Edit Recipes icon (.

16 –Click on the “Recipe Management” tab, then click on the “Groups” tab.

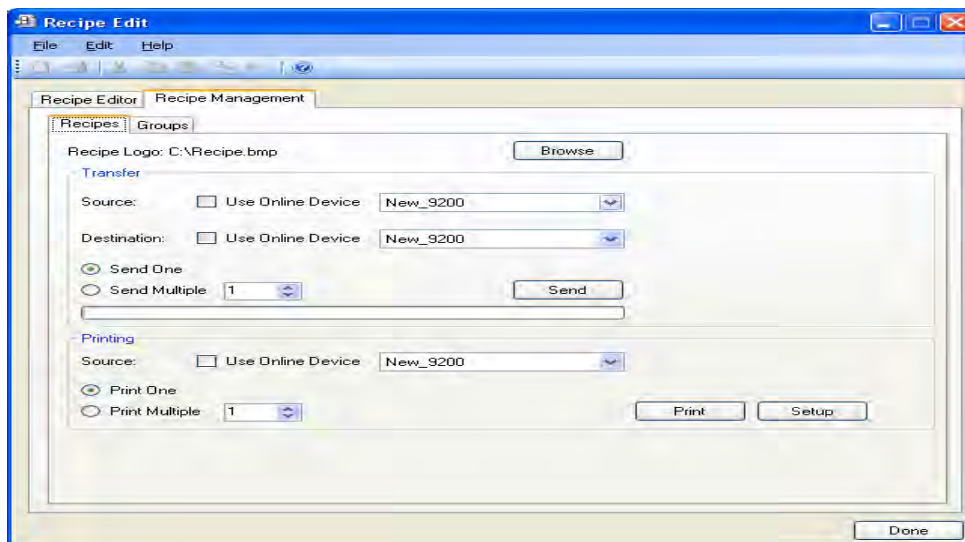


Configurator – Recipe Management tab with Groups tab

17 – Click on the **Add** button

18 – Name the group with the same name of the controller used in step Number 7. Click the **Save** button to save the changes.

19 – Click on the Recipes tab.



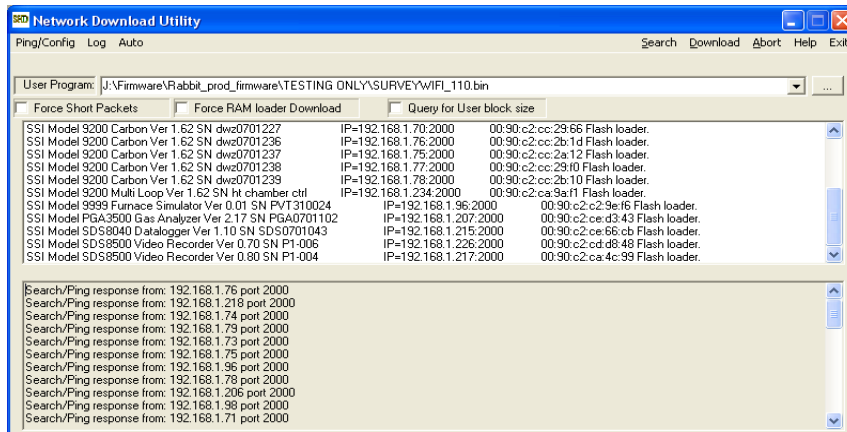
Configurator – Recipe Management tab with Recipes tab

20 – In the “Transfer” section of the form, make sure the “Use Online Device” checkbox is checked for the source, and use the drop-down menu to the right of “Destination:” to select the group that was created in the previous steps.

21 –Select the “Send Multiple” option, and set the left numeric value to **1** and the right numeric value to **300**. Click on the **Send** button to send the recipes. This will save all the recipes from 1 to 300. The user must wait until the send is complete before attempting to move on or click on any items.

22 – Click the **Done** button to return to Configurator’s main screen. The configuration and recipes have been saved.

23 – Go To, or start, the UDP Download software on your PC. All of the available instruments will be populated in the list when the software loads up. *Note – To search for instruments again, click on the **Search** menu option in the top right of the screen. This will start a new search and display all of the available instruments.*



UDP Download – Initial screen

24 – Click on the square box with the three periods marked on it (...). This box is located to the right of the drop-down menu near the top of the screen. This will open a Windows dialog box that will allow the user to navigate the file system.

25 – Use the dialog to navigate to the firmware version stored on the local PC that you wish to use, and click on the **Open** button to select that firmware. The user should see that firmware name and version in the drop-down list to the right of "User Program".

26 – Identify the Serial Number and IP address of the controller you wish to upgrade from the list of items on your network (it will only be one unit if you are hooked up directly to the 9200 through its Ethernet port). Select the controller from this list with a single click. It should be highlighted with a blue background.

When you complete the next step the 9200 will not control your system

27 – Click the **Download** menu option in the top right of the screen. The bottom part of the screen will display the progress of the download, and a progress bar at the top of the screen will also display the progress of the download. Once the progress bar finishes and the list of instruments is reloaded, it is OK to close out the UDP software.

28 – Exit the UDP Download software by clicking on the **Exit** menu option on the top right of the screen.

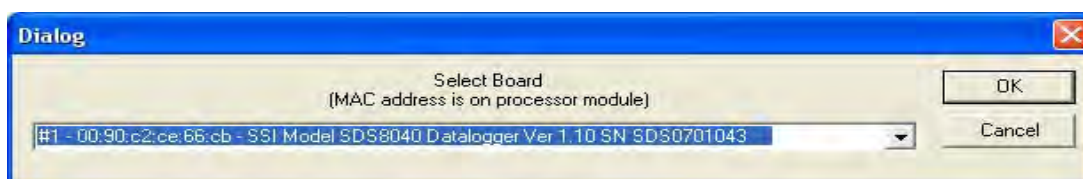
29 – Go To, or start, the LocateIP software on your PC. A list of available instruments will be populated into the list when the software loads.



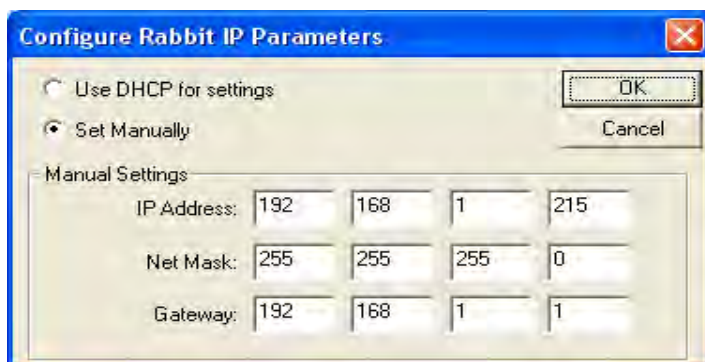
Locate IP – Initial screen

30 – Identify the controller being upgraded by its serial number. The serial number will be the last item on the “Response from” line.

31 – Click the **Configure** button on the upper left side of the screen. Use the drop-down menu to identify the controller being upgraded. Click on the controller. Click on the **OK** button to the right of the drop-down menu. Make a note of the IP Address.



Locate IP – Configure screen



Locate IP – Configure screen 2

32 – Manually change the IP address to match the following:

IP address	192	168	1	200
Net Mask	255	255	255	0
Gateway	192	168	1	1

33 – Click the **OK** button to close the configuration screen, and then click the **Exit** button to exit from the Locate IP software program.

34 – Go To, or start, the Serial Number Utility software on you PC.

35 – In the “Media” section of the form, use the drop-down menu to select “Ethernet”.

36 - In the box below, select the controller being upgraded by identifying the serial number and IP address. Click on the controller to highlight it.

37 – click “Yes” in the “Date And Time” section of the form.

38 – In the “Load Default Configuration” section of the form, use the pull-down menu to select which type of controller is being used.

39 – Click on the **Load** button. A message box will appear asking you if you want to reset the instrument to factory defaults. Click the **YES** button. You will get an error message stating “Unable to Reset Instrument to Factory Defaults”. Ignore this error.

40 – Wait 20 seconds.

41 – Click the **Scan** button in the upper right corner of the form. Identify the controller being upgraded by its serial number. The IP address will have changed to the factory default address of: **192.168.0.200**


42 – Click the **Done** button to exit the Serial Number Utility software.

43 – Go To, or start, the Locate IP software on your PC.

44 – Click the **Configure** button on the upper left side of the form. Use the drop-down menu to identify the controller being upgraded. Click on the controller. Click the **OK** button to the right of the drop-down menu.

45 – Manually change the IP address to match the same address noted in Step Number 31.

49 – Click the **OK** button, then click the **Exit** button on the Locate IP software program.

50 – Select the controller that is being upgraded from the drop-down list and click on the connect icon ().

50 – Using the series 9200 Configurator Software, click on the System Settings () icon.


51 – Click on the “Backup/Restore” tab near the top of the screen.

52 –In the “Backup” section of the form, make sure the “Backup Files” option is selected and select the group/file you wish to restore.

53 – Click the **Restore** button. A message box will appear asking the user to confirm the restoration of the instrument to the selected backup. Click the **Yes** button. *It is important to wait until the restoration is complete before trying to navigate away from this page or click on any items.*

*** The 9200 will regain control after the next step is complete***

54 – Click the **OK** button.

55 – On the main form, click on the “Edit Recipes” icon ().

56 – Click on the “Recipe Management” tab. Make sure the “Recipes” tab is selected.

57 – In the “Transfer” section of the form, use the drop-down menu to the right of “Source” to select the group used in Step Number 20.

58 - Make sure the “Use Online Device” is checked so that the “Destination” will be the upgraded controller.

59 – Make sure the “Send Multiple” option is selected. Make the left numeric value box **1**, and make the right numeric value box **300**. This will restore all the recipes from 1 to 300.

60 – Click the **Send** button. The user must wait until the status bar is complete and all 300 recipes have been restored before attempting to move on or click on any items.

63 – Click the **Done** button to return to Configurator’s main form. The configuration and recipes have been restored.

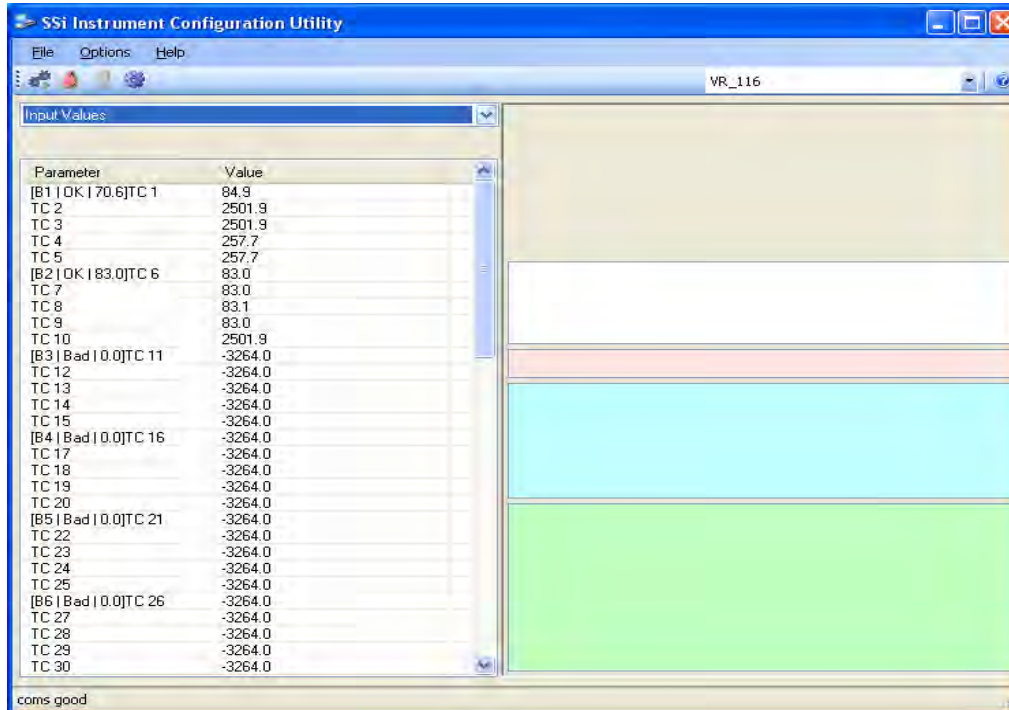
64 - Using the *Analog Input Setup* section of the Super Systems Inc. Configurator, manually change Input 1 type to **1.25** volts.

65 – Exit the Super Systems Inc. Configurator software.

Configurator – 8500 Drop-Down Menu

The 8500 menu currently only has three menu options.

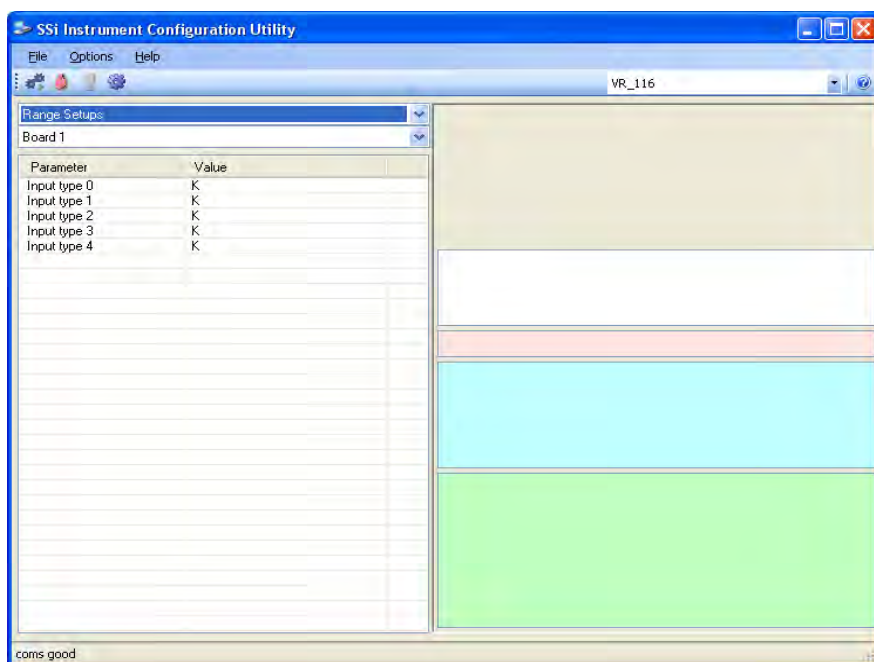
Input Values



Configurator – Input Values menu option

This menu option is a display of the inputs for the video recorder or DAQ module and the corresponding values of the inputs. These values are display only and cannot be modified from this screen.

Range Setups



Configurator – Range Setups Menu Option

The Range Setups menu option will allow the user to set up the ranges for each input and each board. The board to set up can be selected from the second drop-down list under the main menu options. The board options are: **Board 1 – Board 16**. Once a board is selected, the corresponding input types will be displayed. The inputs will be displayed from **Input type 0** to **Input type 4**. Input type 0 is the first input, input type 1 is the second input, etc. Click on any input to modify that input's type.

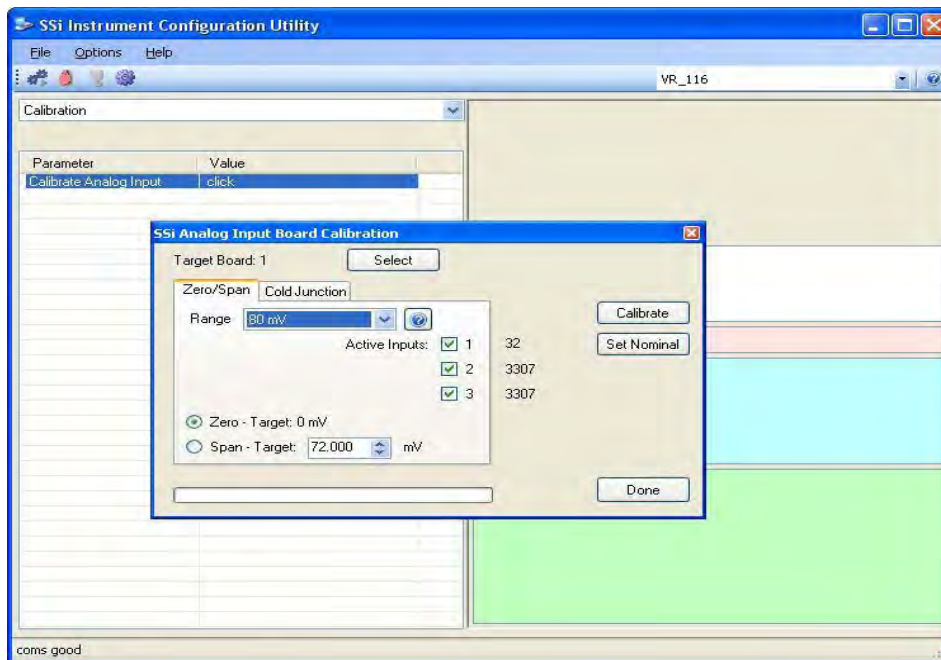


Configurator – Range Setups input types

Select the appropriate input from the drop-down list and click on the **OK** button to set the input type, or click on the **Cancel** button to cancel the action. The list of input types are:

B	NNM	160 mV
C	R	80 mV
E	S	40 mV
J	T	20 mV
K	2.5 Volts	4-20 mA/124 Ω
N	1.25 Volts	4-20 mA/62 Ω

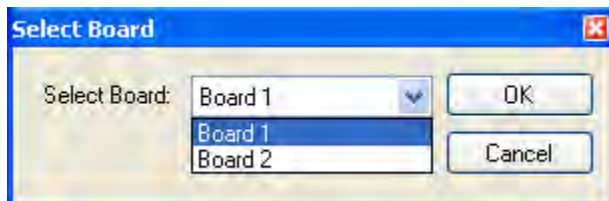
Calibration



Configurator – 8500 Calibration Menu Option

The Calibration menu screen will allow the user to calibration the zero, span, and cold junction trim value for all of the inputs on each board.

The **Select** button will allow the user to select one of the current boards to perform a calibration on.




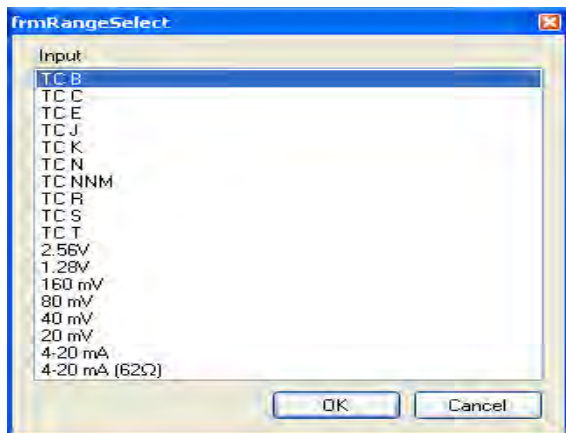
Configurator – Board Selector

Select the appropriate board and click on the **OK** button. Clicking on the **Cancel** button will not select the board to calibrate. *Note: A board must be selected for calibration to begin.* The user will need a thermocouple calibrator capable of outputting a thermocouple signal to calibrate the zero, span or cold junction value of the video recorder data logger. The user will need to connect the calibrator to one of the inputs on the data logger for the channel that will be calibrated. It is recommended to let everything (calibrator and datalogger) sit for approximately thirty minutes to allow the temperature to achieve equilibrium. Set up the calibrator for the specific thermocouple type of the thermocouples in the video recorder datalogger, i.e. type K, type J, etc. Then, source a specific temperature, like 1000 °F, or millivolt to the connected input. It is recommended that the actual temperature used be similar to an appropriate process temperature. For example, if your equipment normally operates at 1700 °F, then perform the cold junction calibration using a 1700 °F signal. It is important to note that when performing a zero or span calibration, *do not use* regular thermocouple wiring. Instead, use any kind of regular sensor wire, or even regular copper wire. To perform the

calibrations, the user will need a calibrator that is capable of outputting volts, millivolts, and temperature.

The "Zero/Span" tab will allow the user to perform a zero and span calibration on the selected board.

The help button -  - next to the "Range" drop-down list will allow the user to select a range based upon an input type if the range is not known.



Configurator – Input Type help screen

Select the input type and click on the **OK** button. The correct millivolt range will be displayed in the drop-down list. Click on the **Cancel** button to cancel this action.

Below is a listing of the suggested ranges for the various TC types.

TC Type mV Range Chart

<u>TC Type</u>	<u>Range in mV</u>
B	20
C	40
E	80
J	80
K	80
N	80
NNM	80
R	40
S	20
T	20

Zero Calibration

To perform a zero calibration, click on the "Zero" option. The circle will be filled in for the selected option. The drop down list under "Range" will allow the user to select the millivolt range of the inputs being calibrated. When a range is selected, the recommended value will also be populated. For a zero calibration, the recommended value is **0**. The list of ranges is:

20 mV
40 mV
80 mV
160 mV
1.28 Volt

The user can individually select each input (one through three/five) to calibrate, where Check = yes (calibrate) and No Check = no (do not calibrate). Once an input is checked, its current value will be displayed.

For a zero calibration, a value of 0 mV will need to be sourced to the input or inputs.

Click on the **Calibrate** button to begin the calibration.

The **Set Nominal** button will set *all* calibration values to their theoretical values. *Note: This function is not a factory default calibration.* This function would be useful if the user wished to restart a calibration from scratch.

A progress bar will be displayed along the bottom of the screen giving the progress of the calibration.

Span Calibration

To perform a span calibration, click on the "Span" option. The circle will be filled in for the selected option. The drop down list under "Range" will allow the user to select the millivolt range of the inputs being calibrated. When a range is selected, the recommended value will also be populated. For a span calibration, the recommended value is 90 % of the full range. For example, if the range is 80 mV, then the span should be **72**. The recommended value can be changed either by using the up and down arrows to adjust the value, or by clicking on the value, and entering the new value that way. The user can also individually select each input (one through five) to calibrate, where Check = yes (calibrate) and No Check = no (do not calibrate). Once an input is checked, its current value will be displayed.

For a span calibration, a value of 90 % of the full range will need to be sourced to the input or inputs.

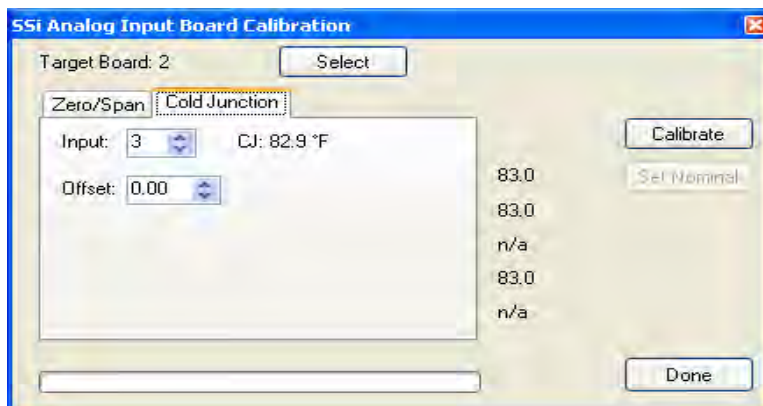
Click on the **Calibrate** button to begin the calibration.

The **Set Nominal** button will set *all* calibration values to their theoretical values. *Note: This function is not a factory default calibration.* This function would be useful if the user wished to restart a calibration from scratch.

A progress bar will be displayed along the bottom of the screen giving the progress of the calibration.

Cold Junction Calibration


The "Cold Junction" tab will allow the user to perform a cold junction trim on the selected board.



Configurator – Cold Junction Trim screen

The user can select the input to perform the trim on from the "Input:" box. The user can enter the cold junction offset in the "Offset:" box. The current cold junction value will be displayed next to the "CJ:" line. Also, the current values from the selected inputs will be displayed on the right of the tab. To display an input's value on the "Cold Junction" tab, click on the "Zero/Span" tab and check that input's checkbox, then return to the "Cold Junction" tab. Click on the **Calibrate** button to begin the calibration.

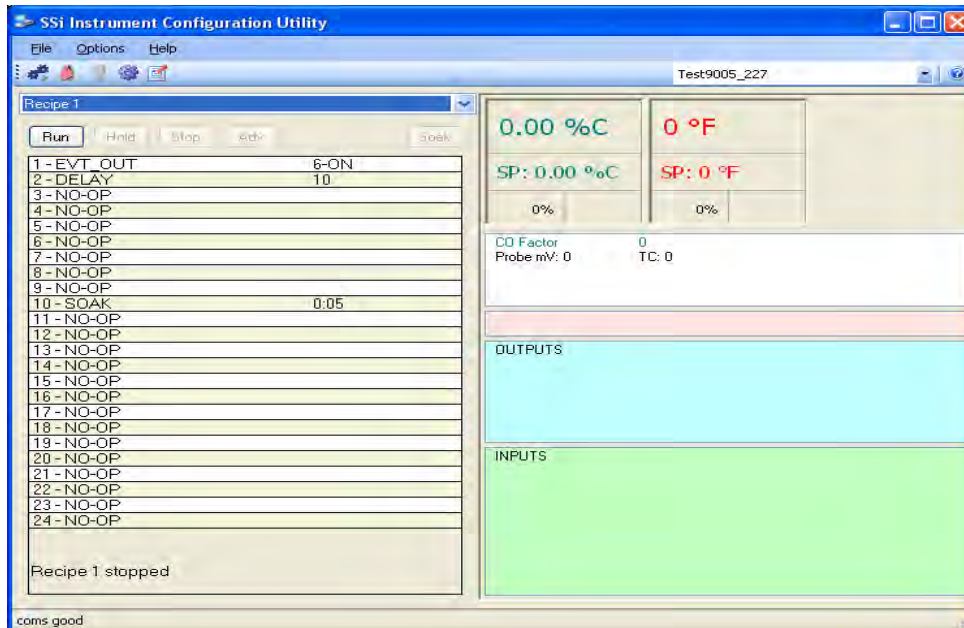
Click on the **Done** button to close down the screen.



Configurator-9005 Drop-Down Menu

Recipe 1 – Recipe 4

The first four menu items – *Recipe 1*, *Recipe 2*, *Recipe 3*, and *Recipe 4* – will display the currently running recipes, if any, on each of the four programmers for the 9005 controller. *Recipe 1* will display the recipe for programmer 1; *Recipe 2* will display the recipe for programmer 2, etc. The user has the ability to start, stop, or hold a recipe running on any of the programmers using the first four menu options.



Configurator – Recipe 1 – Recipe 4 menu option

Slave Instruments

*** This menu option is the same as the *Slave Instruments* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Auxiliary A/I

Manual Event Control

*** This menu option is similar to the *Manual Event Control* menu option under the *Configurator-9200 Drop-Down Menu*. ***

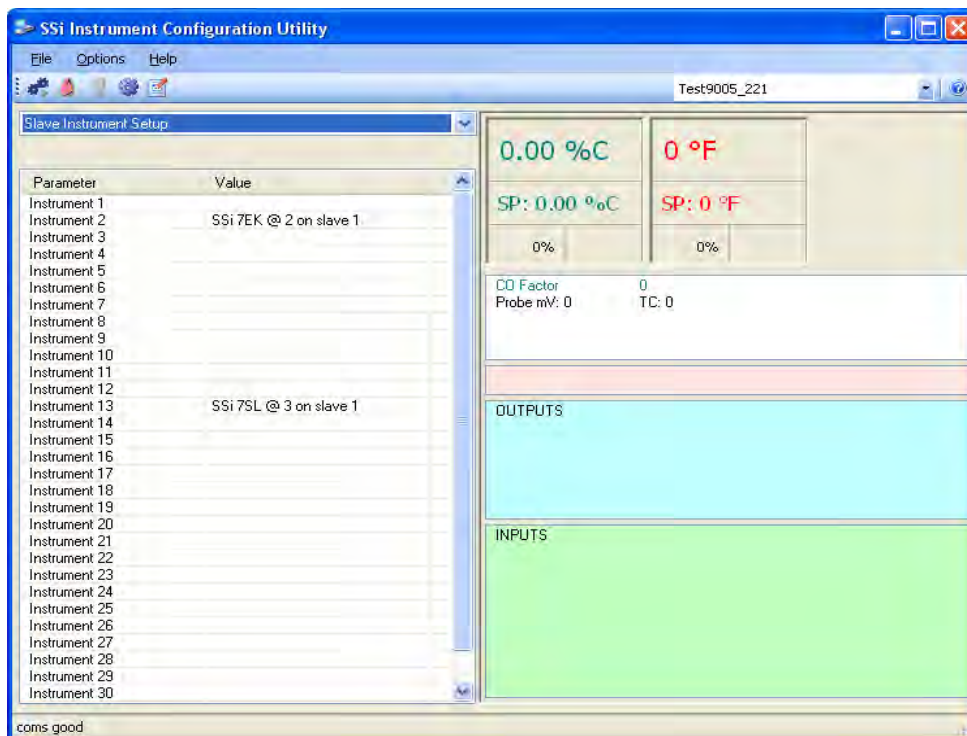
Event Run Program Setup

*** This menu option is the same as the menu option *Event Run Program Setup* under the *Configurator-9200 Drop-Down Menu*, except the user can set the event run program for each of the four programmers. ***

Port Setup

*** This menu option is the same as the menu option *Port Setup* under the *Configurator-9200 Drop-Down Menu*. ***

Slave Instrument Setup



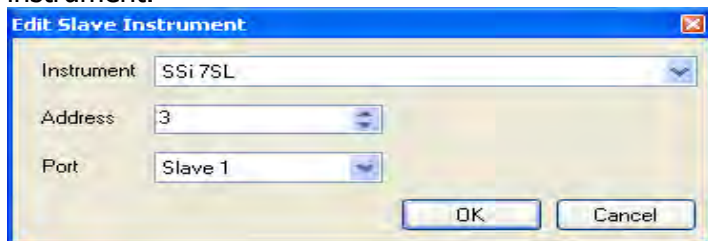
Configurator – Slave Instrument Setup menu option

** All devices on the same slave port must utilize the same protocol

** An address of zero (0) will disable the instrument**

Some controllers (AC20 for example) can provide dual functions (atmosphere and events) and must have the same address assigned for both.

Clicking on the "Value" field for any instrument will allow the user to select the slave instrument.



Configurator – Edit Slave instrument dialog

Instrument:

This value will allow the user to select the slave instrument type.

List of Instruments:

SSi AC20

10Pro

Mod Mux

[A]Yokogawa 750	Dualpro IN C	Dualpro E Modbus
[A]Honeywell UDC3300	[T]9200 LP1	Dualpro E MMI
[A]Dualpro LP1 Modbus	[T]9200 LP2	Carbpro E v3.5
[A]Dualpro LP2 Modbus	[T]9200 LP3	Carbpro E v3.0
[A]Dualpro LP1 MMI	9100 LP 2	Eurotherm 2500
[A]Dualpro LP2 MMI	Eurotherm 2704 LP1	SSi 8-8
[A]Eurotherm 2404	Eurotherm 2704 LP2	SSi 9200 E
[A]Eurotherm 2500	Eurotherm 2704 LP3	Micrologix PLC
[A]Carbpro v3.5	VC Base 1	MCM Module
[A]Carbpro v3.0	VC Base 2	PLC5 DF1
CarbPC	VC Base 3	SLK DF1
[A]9200 LP1	VC Base 4	User 1
IR Base	AIPC	User 2
MGA	SSi 7SL	User 3
SSi 7EK	SSi Flow Board	User 4
[T]Yokogawa 750	UMC800 LP 1	User 5
[T]Honeywell UDC3300	SSi Quad AO1	User 6
[T]Dualpro LP1 Modbus	SSi Quad AO2	User 7
[T]Dualpro LP2 Modbus	SSi Quad AO3	User 8
[T]Dualpro LP1 MMI	SSi Quad AO4	User 9
[T]Dualpro LP2 MMI	Yokogawa UT350	User 10
[T]Eurotherm 2404	Yokogawa 750 Lp 2	User 11
[T]Eurotherm 2500	Yokogawa UP350	User 12
Unipro v3.5	Honeywell DCP551	User 13
Unipro v3.0	Ascon 08	User 14
[T]Carbpro v3.5 Slave	SSi AC E	User 15
[T]Carbpro v3.0 Slave	Yokogawa 750E	User 16

The "User[X]" values correspond to any of the generic instruments set up through the *Generic Mapping Setups* menu option.

Address:

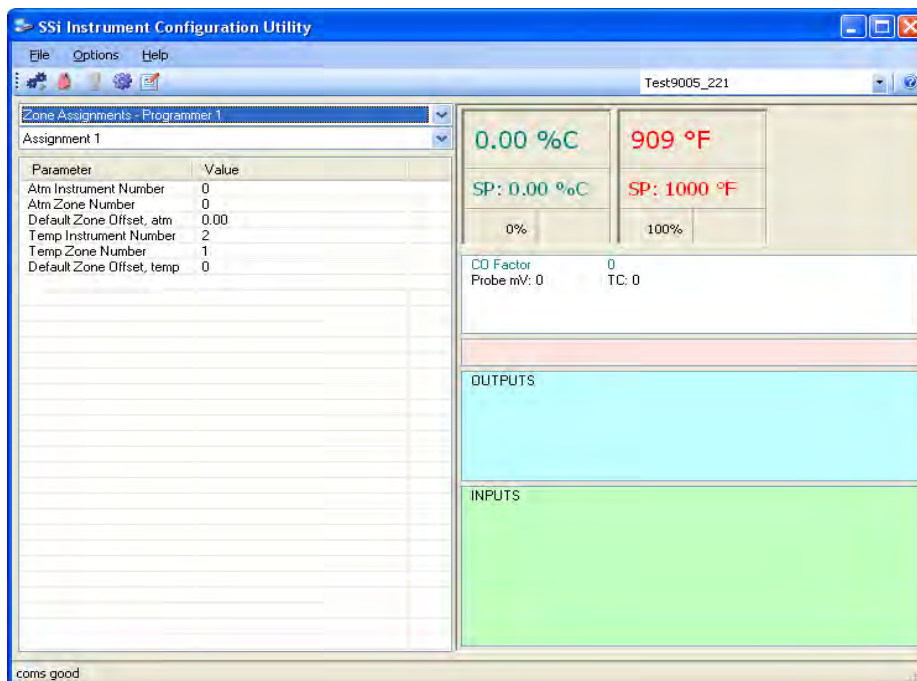
This value allows the user to select the address that corresponds with the controller selected, with a range of 0 to 249.

Port:

The list of options is:

- Slave 1
- Slave 2
- IP Address 1
- IP Address 2
- IP Address 3
- IP Address 4
- Passive
- Slave 3/RS-232

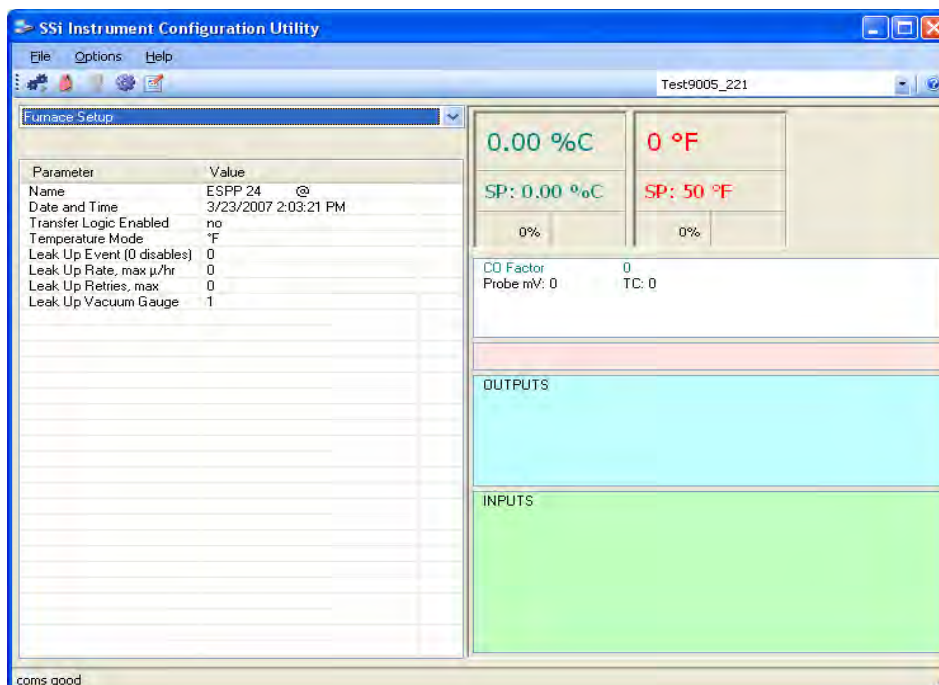
Zone Assignments – Programmer 1 – Zone Assignments - Programmer 4



Configurator – Zone Assignments – Programmer 1 – Zone Assignments – Programmer 4 menu option

These four menu options – *Zone Assignments – Programmer 1*, *Zone Assignments – Programmer 2*, *Zone Assignments – Programmer 3*, and *Zone Assignments – Programmer 4* – will allow the user to set up the assignments – *Assignment 1 – Assignment 5* – for each programmer.

Furnace Setup



Configurator – Furnace Setup menu option

The Furnace Setup menu option will allow the user to set up the furnace information.

Name:

This value will define the name of the furnace. Clicking on the "Value" column will bring up an input box where the user can enter the furnace's name.

Date and Time:

This value is the current date and time on the 9005 controller (not the local computer). Clicking on the "Value" column will allow the user to set a new date and time on the controller.

Transfer Logic Enabled:

This value will determine if the transfer logic is enabled or disabled. The options are **No** or **Yes**.

Temperature Mode:

This value will define the mode of the temperature (°F or °C). The options are **°F** or **°C**.

Leak Up Event (0 disables):

This value will determine what the Leak Up Event will be. The range is **0** to **48**, where **0** will disable.

Leak Up Rate, max μ /hr:

This value will define the maximum leak up rate, in μ /hr. The range is **0** to **65**.

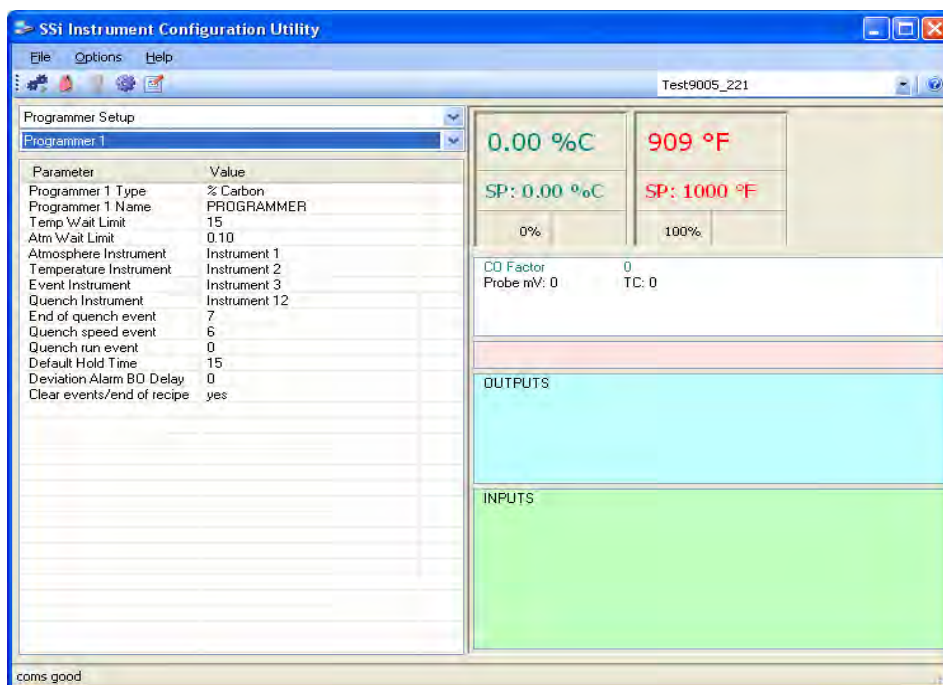
Leak Up Retries, max:

This value will define the maximum leak up retries. The range is **0** to **500**.

Leak Up Vacuum Gauge:

This value will define the leak up test gauge number. The range is **1** to **4**.

Programmer Setup



Configurator – Programmer Setup menu option

This menu option will allow the user to set up each programmer, **Programmer 1** – **Programmer 4**, with programmer-specific values.

Programmer Type:

This value will determine what type the programmer is. The list of values is:

% Carbon	Multi-Loop
Dew Point	% Carbon + Dual Temp
% O2	Cascade
Millivolts	

Programmer Name:

This value will apply a name to the programmer. There will be an input box for the user to enter the name.

Temp Wait Limit:

This value will define the temperature wait limit. The range is **0** to **4000**.

Atm Wait Limit:

This value will define the atmosphere wait limit. The range is **0.00** to **40.00**.

Atmosphere Instrument:

This value will define which instrument will be the atmosphere instrument. The list of choices is: **Instrument 1** through **Instrument 25**.

Temperature Instrument:

This value will define which instrument will be the temperature instrument. The list of choices is: **Instrument 1** through **Instrument 25**.

Event Instrument:

This value will define which instrument will be the event instrument. The list of choices is: **Instrument 1** through **Instrument 25**.

Quench Instrument:

This value will define which instrument will be the quench instrument. The list of choices is: **Instrument 1** through **Instrument 25**.

End of Quench Event:

This value will define which event will signify the end of Quench. The list of options is: **0** to **14**.

Quench Speed Event:

This value will define which event will signify the Quench Speed event. The list of options is: **0** to **14**.

Quench Run Event:

This value will define which event will signify the Quench Run event. The list of options is: **0** to **14**.

Default Hold Time:

This value will define the default hold time, in minutes. The range is **0** to **10000**.

Deviation Alarm BO Delay:

This value will define the deviation alarm's burnoff delay, in minutes. The range is **0** to **10000**.

Clear events/end of recipe:

This value will determine whether the events will be cleared at the end of a recipe. The possible choices are **no** and **yes**.

Passcode and Alarm

*** This menu option is the same as the *Passcode and Alarm* menu option under the *Configurator-9200 Drop Down Menu*. ***

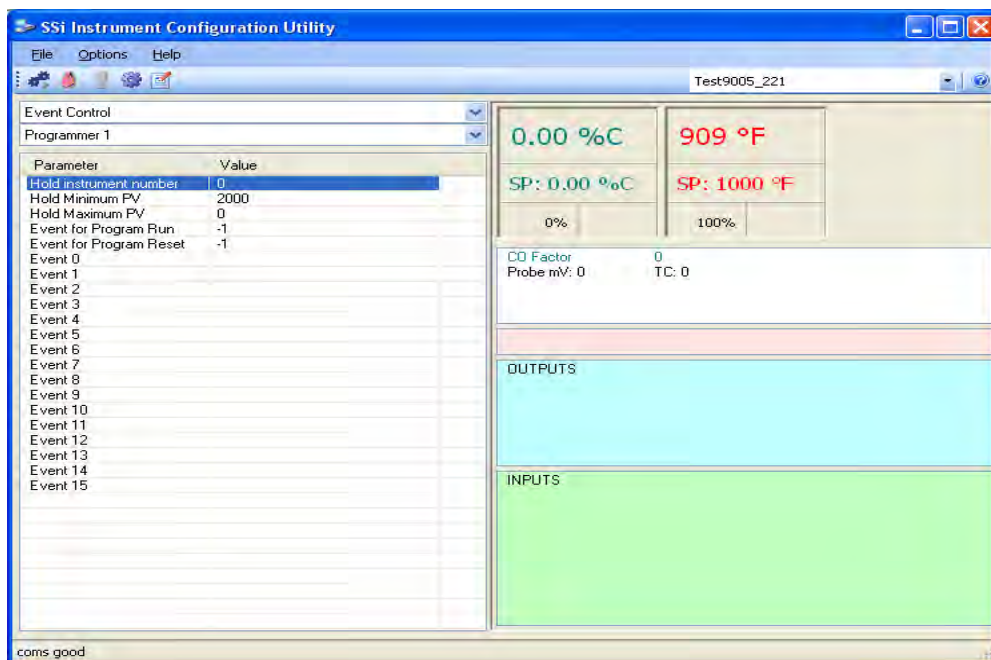
IP Address

*** This menu option is the same as the *IP Address* menu option under the *Configurator-9200 Drop Down Menu*. ***

Zone/Load TC Setup

*** This menu option is the same as the menu option *Zone/Load TC Setup* under the *Configurator-9200 Drop-Down Menu*. ***

Event Control



Configurator – Event Control menu option

The Event control provides the user manual control of actual event outputs for each of the four programmers. This is useful when testing wiring and field devices.

Hold Instrument Number:

Clicking on this value will display an input box from which the user can select a new value. The range is **0** to **32**.

Hold Minimum PV:

Clicking on this value will display an input box from which the user can select a new value. The range is **0** to **4000**.

Hold Maximum PV:

Clicking on this value will display an input box from which the user can select a new value. The range is **0** to **4000**.

Event for Program Run:

Clicking on this value will display an input box from which the user can select a new value. The range is **–1** to **15**.

Event for Program Reset:

Clicking on this value will display an input box from which the user can select a new value. The range is **–1** to **15**.

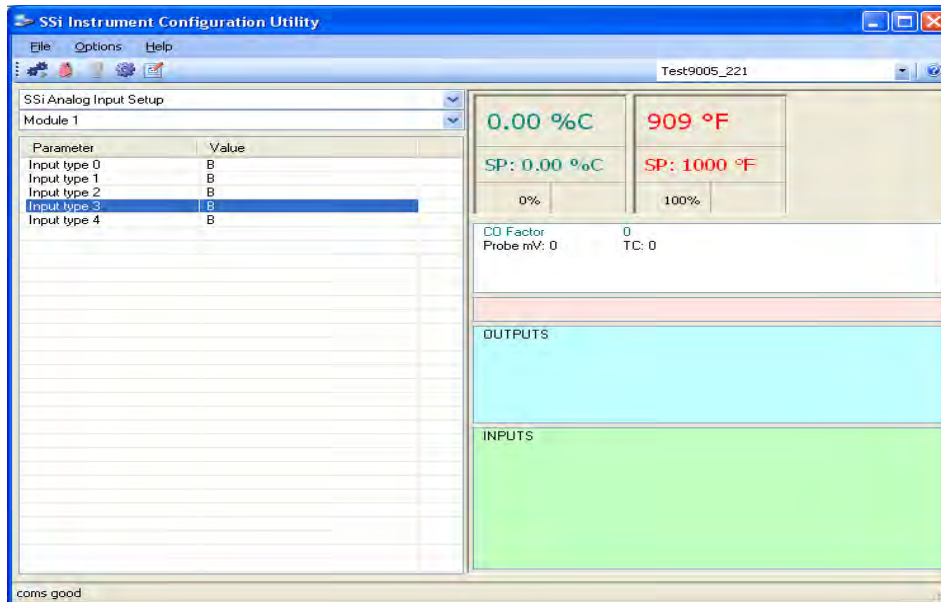
Event 0 Through Event 15:

The input box for these events has two drop-down lists. The top list contains **active** and **inactive**, and the bottom list contains **closed** and **open**.

Set Menu Security

*** This menu option is the same as the menu option *Set Menu Security* under the *Configurator-9200 Drop-Down Menu*. ***

SSi Analog Input Setup

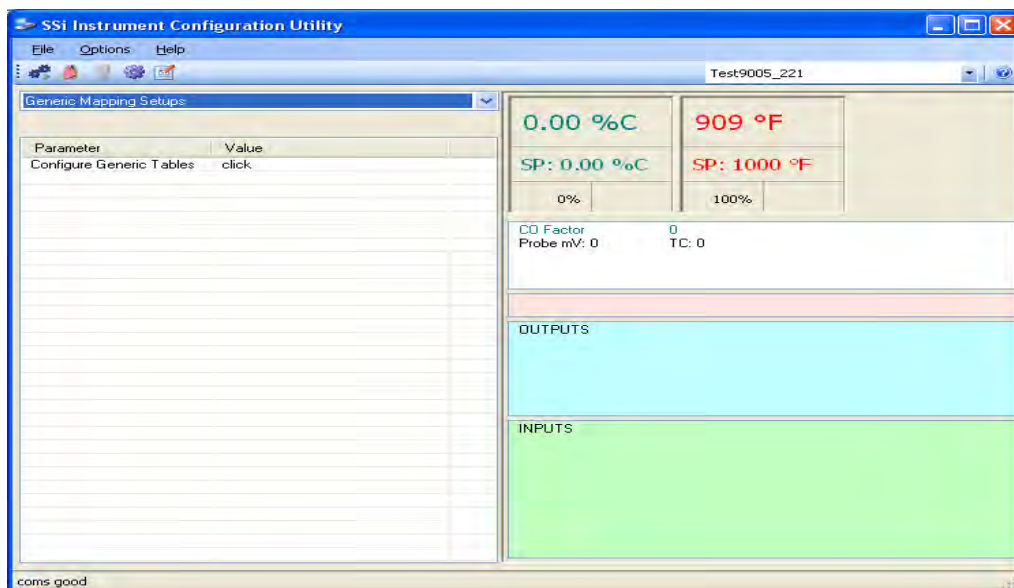


Configurator – SSi Analog Input Setup menu option

The SSi Analog Input Setup menu option allows the user an input selection of five inputs per module. There are eight modules available. It is configurable for voltage of T/C (universal input), and it is typically used for Load T/Cs and Auxiliary Flow Meters. Clicking on any of the values will display an input box from which the user can select the input type from a drop-down list with the following values:

B	NNM	160 mV
C	R	80 mV
E	S	40 mV
J	T	20 mV
K	2.5 volts	4-20 mA/124Ω
N	1.25 volts	4-20 mA/62Ω

Generic Mapping Setups



Configurator – Generic Mapping Setups menu option

This menu option will allow the user to configure a generic instrument for the 9005 controller. Clicking on the “click” in the value column will start the configuration process by displaying the Generic Instrument Edit form.

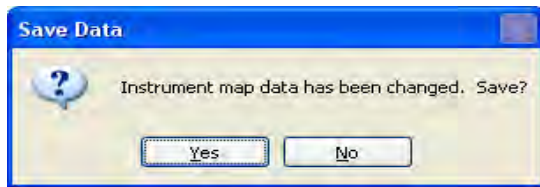
The screenshot shows the 'Generic Instrument Setup' form. It is divided into three main sections: 'Communications and Mapping Table', 'Block Write Table', and 'IP Address Table'. The 'Communications and Mapping Table' section includes a dropdown for 'Instrument 1', a 'Reads' dropdown set to 'Read 1', and a table for mapping process variables (PV, SP, Output) to instrument registers (123, 130, 142) with associated scales. The 'Block Write Table' section includes a 'Write 1' dropdown, 'Instrument Number' (1), 'Data Register Offsets' (100), 'Source (9000 +)' (225), 'Update Interval (seconds)' (60), and 'Number of Words to Send' (2). The 'IP Address Table' section includes a dropdown for 'IP 1' and IP address fields (192, 168, 1, 227) and a 'Port' field (502). Each section has an 'Apply' button, and there is a 'Done' button at the bottom right.

Configurator – Generic Instrument Edit form

Communications and Mapping Table Section

This section of the form allows the user to set up the communications information for the generic instrument, as well as the mapping for the process variable, setpoint, and output. The top drop-down list will allow the user to select which instrument to set up. The options are: **Instrument 1 – Instrument 16**. *Note: If any changes have been made to the current*

instrument/Read, the user will have the option to save the changes before the new instrument is selected.



Configurator – Confirm Save Changes to Instrument Map

Clicking on the **Yes** button will save the changes and select the new instrument. Clicking on the **No** button will not save any changes and it will select the new instrument.

The generic instrument's data will be stored in certain registers on the host instrument, such as the 9005 controller. Each instrument is given a certain set of registers, starting with register 1000. To determine the beginning register, use the following calculation: $(100 * \text{generic instrument's number} (1 - 16)) + 900$. Therefore, instrument 1 would begin at register 1000: $(100 * 1) + 900$. Instrument 7 would begin at register 1600: $(100 * 7) + 900$. Each instrument is allotted 100 registers, therefore, instrument 1's allotment is from register 1000 to 1099 on the 9005 controller, instrument 2's allotment is from register 1100 to 1199 on the 9005 controller, etc.

The "Reads" drop-down list will allow the user to select up to three reads to set up. The options are: **Read 1 – Read 3**. *Note: If any changes have been made to the current instrument/Read, the user will have the option to save the changes before the new read is selected.* The reads will read in information from the slave instrument based on the register offset given in the "Instrument Register Offset" box.

The "Instrument Register Offset" will allow the user to set the slave instrument's initial physical register offset to begin the read. This will be the actual register in the slave instrument. The range is **0 to 100,000**.

The "Register Count" will allow the user to set the count of the registers. This option will set the number of consecutive registers to read. For example, if the "Instrument Register Offset" is 125, and the "Register Count" is 20, then the read command will read registers 125 – 144 in the slave instrument. The range is **0 to 100**.

The "Storage Offset" will allow the user to set the physical register offset for storage in the host instrument, such as the 9005 controller. This will be the register where the data is stored. This option will be more useful if more than one read is used. If only one read is used, a value of 0 will be sufficient. The value will be based upon the specific instrument selected. If the value is 0 and the selected instrument is instrument 2, then the data will be stored starting in register 1100 on the 9005 controller. If the value was 25, then the data would be stored starting in register 1124, for instrument 2. The range is **0 to 99**.

The "PV" Memory box will allow the user to set the location in memory for the process variable.

The "SP" Memory box will allow the user to set the location in memory for the set point. The

"Output" Memory box will allow the user to set the location in memory for the output. The locations in memory for these values are related to the read register counts set up in the "Register Count" box. For example if the initial register offset is 125, and the PV is located in register 130, then the "PV" Memory box would be set to 5. If the PV is located in register 125, then the "PV" Memory box would be set to 0. The range for all of the Memory boxes is **0 to 99**.

The "PV" Instrument Register box will allow the user to set the physical instrument register for the process variable. The "SP" Instrument Register box will allow the user to set the physical instrument register for the set point. The "Output" Instrument Register box will allow the user to set the physical instrument register for the output. These registers will be the actual registers in the slave instrument where the data is located. The range for all of the Instrument Register boxes is **0** to **100,000**.

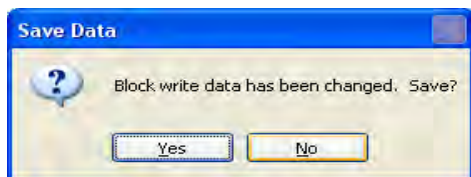
The "PV" Input Scale box will allow the user to set the input scaling for the process variable. The "SP" Input Scale box will allow the user to set the input scaling for the set point. The "Output" Input Scale box will allow the user to set the input scaling for the output. This value will be used as a divider when any value is read in. For example, if the scaling is set to 10, and a 5005 is read in, the value will be treated as 500.5. The range for all of the Input Scale boxes is **1** to **100**.

The "PV" Output Scale box will allow the user to set the output scaling for the process variable. The "SP" Output Scale box will allow the user to set the output scaling for the set point. The "Output" Output Scale box will allow the user to set the output scaling for the output. This value will be used as a multiplier if any value needs to be written somewhere. For example, if the scaling is set to 10, and a value of 510 needs to be sent, the value that will be sent will be 5100. The range for all of the Output Scale boxes is **1** to **100**.

The **Apply** button will set any changes made in the "Communications and Mapping Table" section.

Block Write Table Section

This section of the form allows the user to set up the write block for an instrument. This will allow the user to write data to a specific instrument. The drop-down list will allow the user to select which write block to set up. The options are: **Write 1 – Write 5**. *Note: If any changes have been made to the current write block, the user will have the option to save the changes before the new write block is selected.*



Configurator – Confirm Save Changes to Block Write

Clicking on the **Yes** button will save the changes and select the new write block. Clicking on the **No** button will not save any changes and it will select the new write block.

The "Instrument Number" box will allow the user to select the instrument to write to. This will select the specific slave instrument to write to. The slave instruments can be set up on the *Slave Instrument Setup* menu option. See the section *Slave Instrument Setup* for more information on setting up a slave instrument. The range is **0** to **32**.

The "Update Interval (seconds)" box will allow the user to set the update interval in seconds for the write. This will determine how often the slave instrument will be written to. The range is **0** to **300** seconds.

The "Data Register Offsets" box will allow the user to set up the data register offsets for the write to read from. This will be the beginning register on the host instrument, such as a 9005 controller, to read from. The read will be as long as the value in the "Number of Words to Send" box. The range is **0** to **999**.

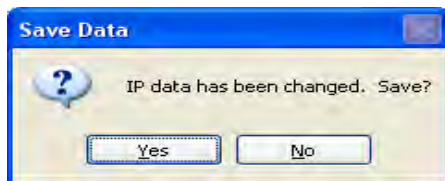
The "Number of Words to Send" box will allow the user to set the number of words to send with each write. The range is **0** to **150**.

The "Target" box will allow the user to set the target for the write. This will be the target register to begin the write process to on the selected slave instrument. The range is **0** to **32,767**.

The **Apply** button will set any changes made in the "Block Write Table" section.


IP Address Table Section

This section of the form allows the user to set up the IP address and ports for the slave instruments. The IP addresses will be located in the "Port" drop-down list on the *Slave Instrument Setup* menu option screen. *Note: Currently, only **IP Address 1** – **IP Address 4** is available in the 9005 controller for the "Port" option.* The drop-down list will allow the user to select which IP address to set up. The options are: **IP 1** – **IP 16**. *Note: If any changes have been made to the current IP Address, the user will have the option to save the changes before the new IP Address is selected.*



Configurator – Confirm Save Changes to IP Address

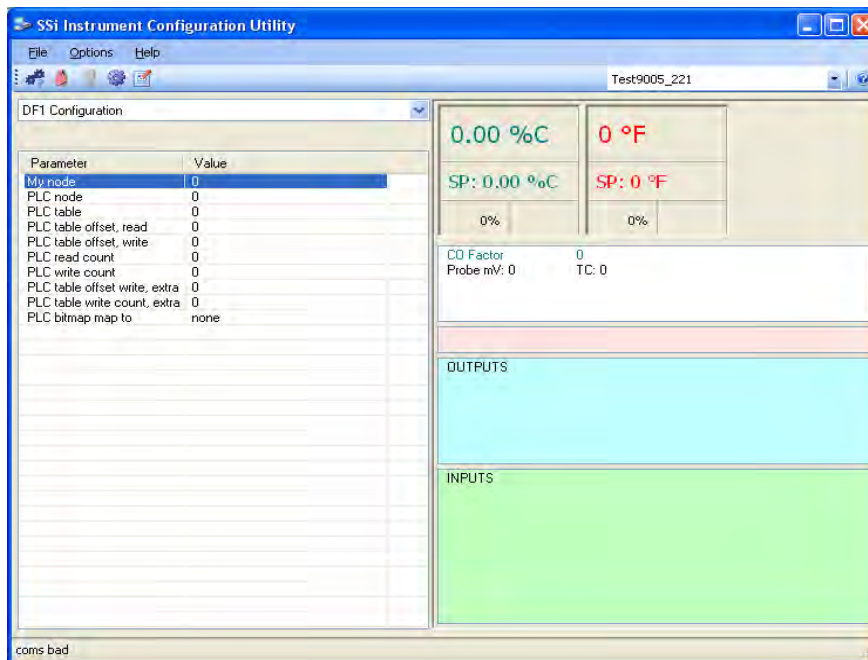
Clicking on the **Yes** button will save the changes and select the new IP Address. Clicking on the **No** button will not save any changes and it will select the new IP Address.

The four boxes separated by periods -  - will allow the user to enter the IP Address. The range for all four boxes is **0** to **255**.

The "Port" box will allow the user to set up the port for the IP Address. *Note: The port will typically be **502**.* The range is **0** to **100,000**.

The **Apply** button will set any changes made in the "IP Address Table" section.

DF1 Configuration



Configurator – DF1 Configuration menu option

My Node:

This option will allow the user to select the node. This node must not exist anywhere else on the computer's network. The range is **0** to **30000**.

PLC node:

This option will allow the user to select the PLC node. This must be the node address of a PLC. The range is **0** to **30000**.

PLC table:

This option will allow the user to select the PLC table. The range is **0** to **30000**.

PLC table offset, read:

This option will allow the user to select the PLC table read offset. This is the read offset for the PLC. The range is **0** to **30000**.

PLC table offset, write:

This option will allow the user to select the PLC table write offset. This is the write offset for the PLC. The range is **0** to **30000**.

PLC read count:

This option will allow the user to select the PLC read count. This will be the number of words to read from the PLC. The range is **0** to **30000**.

PLC write count:

This option will allow the user to select the PLC write count. This will be the number of words to write to the PLC. The range is **0** to **30000**.

PLC table offset write, extra:

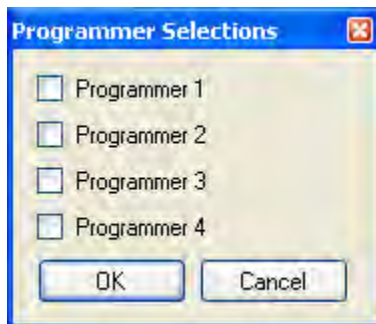
This option will allow the user to select the PLC table write offset extra. This is the extra write offset for the PLC. The range is **0** to **30000**.

PLC table write count, extra:

This option will allow the user to select the PLC table write count extra. This will be the number of extra words to write to the PLC. The range is **0** to **30000**.

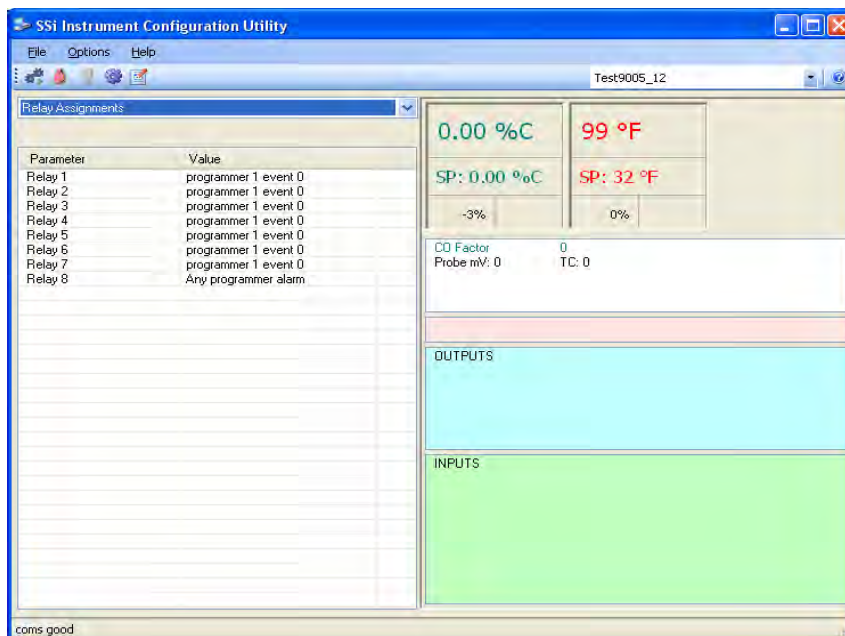
PLC bitmap map to:

This option will allow the user to select the object to map the PLC bitmap to. The user has the option of: **Programmer 1, Programmer 2, Programmer 3, and/or Programmer 4.**



Configurator – Programmer Selections

Relay Assignments



Configurator – Relay Assignments menu option

The 9005 controller has the option of using eight relay outputs. All of the relays have a positive common terminal and independent negative terminals. *Note: Relay 8 is not modifiable – its value will always be **Any programmer alarm**.* The options for the relay events are:

Programmer 1 event 0	Programmer 2 event 7	Programmer 3 event 14
Programmer 1 event 1	Programmer 2 event 8	Programmer 3 event 15
Programmer 1 event 2	Programmer 2 event 9	Programmer 4 event 0
Programmer 1 event 3	Programmer 2 event 10	Programmer 4 event 1
Programmer 1 event 4	Programmer 2 event 11	Programmer 4 event 2
Programmer 1 event 5	Programmer 2 event 12	Programmer 4 event 3
Programmer 1 event 6	Programmer 2 event 13	Programmer 4 event 4
Programmer 1 event 7	Programmer 2 event 14	Programmer 4 event 5
Programmer 1 event 8	Programmer 2 event 15	Programmer 4 event 6
Programmer 1 event 9	Programmer 3 event 0	Programmer 4 event 7
Programmer 1 event 10	Programmer 3 event 1	Programmer 4 event 8
Programmer 1 event 11	Programmer 3 event 2	Programmer 4 event 9
Programmer 1 event 12	Programmer 3 event 3	Programmer 4 event 10
Programmer 1 event 13	Programmer 3 event 4	Programmer 4 event 11
Programmer 1 event 14	Programmer 3 event 5	Programmer 4 event 12
Programmer 1 event 15	Programmer 3 event 6	Programmer 4 event 13
Programmer 2 event 0	Programmer 3 event 7	Programmer 4 event 14
Programmer 2 event 1	Programmer 3 event 8	Programmer 4 event 15
Programmer 2 event 2	Programmer 3 event 9	Programmer 1 alarm
Programmer 2 event 3	Programmer 3 event 10	Programmer 2 alarm
Programmer 2 event 4	Programmer 3 event 11	Programmer 3 alarm
Programmer 2 event 5	Programmer 3 event 12	Programmer 4 alarm
Programmer 2 event 6	Programmer 3 event 13	N/A

The user also has the option to select:

Programmer Alarm

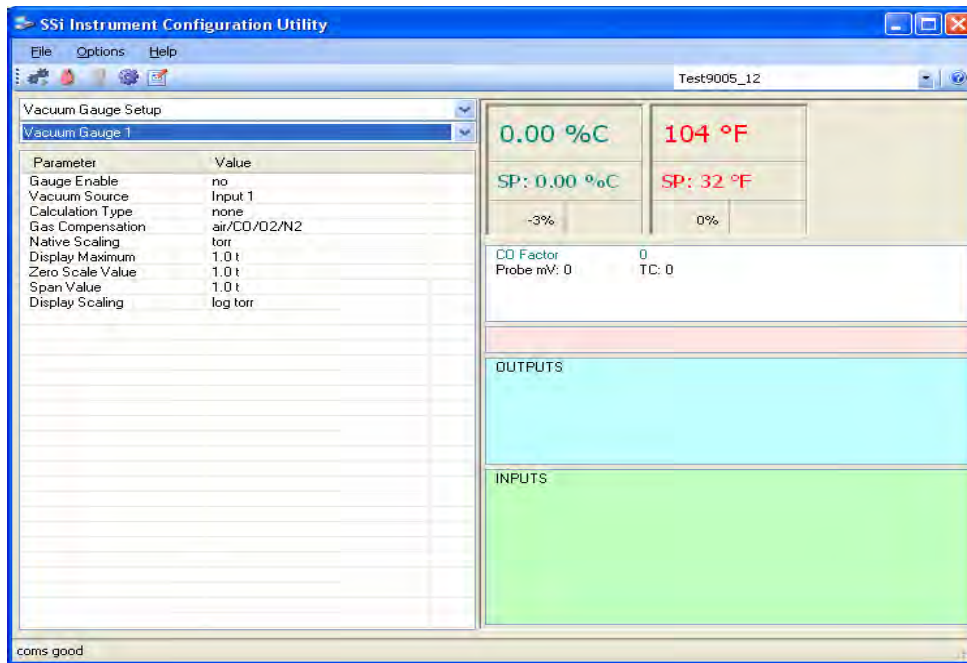
Alarm 1

Alarm 2

Alarm 3

Thermocouple check

Vacuum Gauge Setup



Configurator – Vacuum Gauge Setup menu option

The Vacuum Gauge Setup menu option will allow the user to set up the vacuum gauges for the 9005 controller. The user can setup: **Vacuum Gauge 1 – Vacuum Gauge 4.**

Gauge Enable:

This option will either enable or disable the gauge. Click the **Yes** option to enable the gauge, or click the **No** option to disable the gauge.

Vacuum Source:

This option will allow the user to select the source of the vacuum gauge. The options are:

- Input 1
- Input 2
- Input 3
- Televac Gauge 1
- Televac Gauge 2
- Televac Gauge 3
- Televac Gauge 4

Calculation Type:

This option will allow the user to select the calculation type for the vacuum gauge. The options are:

- None
- Linear Log
- Inficon Pirani equation

Gas Compensation:

This option will allow the user to select the gas compensation type for the vacuum gauge. The options are:

Air/CO/O2/N2

Helium

Neon

Argon

Krypton

Xeon

H2

CO2

Water vapor

Freon 12

Native Scaling:

This option will allow the use to set up the native scaling for the vacuum gauge. The options are:

Torr

Microns

Millibars

Bars

Pascals

Kilopascals

Log of torr

Display Maximum:

This option will allow the user to set the maximum value for display purposes. The range is: - **10.00** to **10.00** with an exponent range of **-31** to **31**.

Zero Scale Value:

This option will allow the user to set the zero scale value for the vacuum gauge. The range is: **-10.00** to **10.00** with an exponent range of **-31** to **31**.

Span Value:

This option will allow the user to set the span value for the vacuum gauge. The range is: - **10.00** to **10.00** with an exponent range of **-31** to **31**.

Display Scaling:

This option will let the user set the scaling for display purposes. The options are:

Log torr

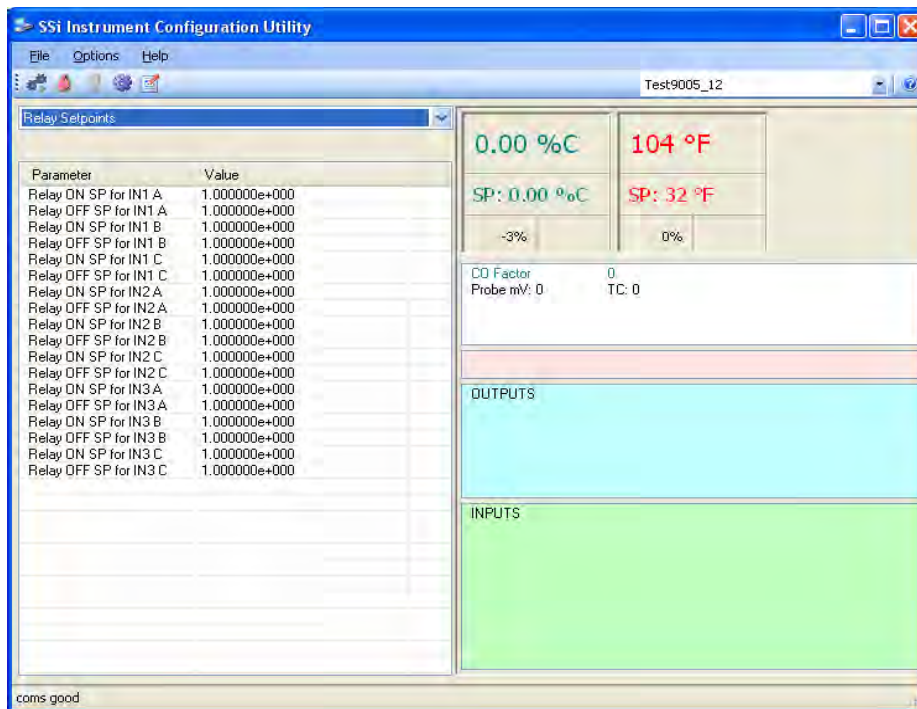
Torr

Microns

Millibars

Pascals

Relay Setpoints



Configurator – Relay Setpoints Menu Option

The Relay Setpoints menu option will allow the user to set the setpoints that will turn each relay on or off. The options for the setpoints are:

ON SP for IN1 A	ON SP for IN2 A	ON SP for IN3 A
OFF SP for IN1 A	OFF SP for IN2 A	OFF SP for IN3 A
ON SP for IN1 B	ON SP for IN2 B	ON SP for IN3 B
OFF SP for IN1 B	OFF SP for IN2 B	OFF SP for IN3 B
ON SP for IN1 C	ON SP for IN2 C	ON SP for IN3 C
OFF SP for IN1 C	OFF SP for IN2 C	OFF SP for IN3 C

The range for each setpoint is: **-10.00** to **10.00** with an exponent range of **-31** to **31**.

Configurator-9120 Drop-Down Menu

Burnoff

*** This menu option is the same as the menu option *Burnoff* under the *Configurator-9200 Drop-Down Menu*. ***

Slave Instruments

*** This menu option is the same as the menu option *Slave instruments* under the *Configurator-9200 Drop-Down Menu*. ***

Aux Analog Inputs

*** This menu option is similar to the menu option *Auxiliary Analog Input* under the *Configurator-9200 Drop-Down Menu*. ***

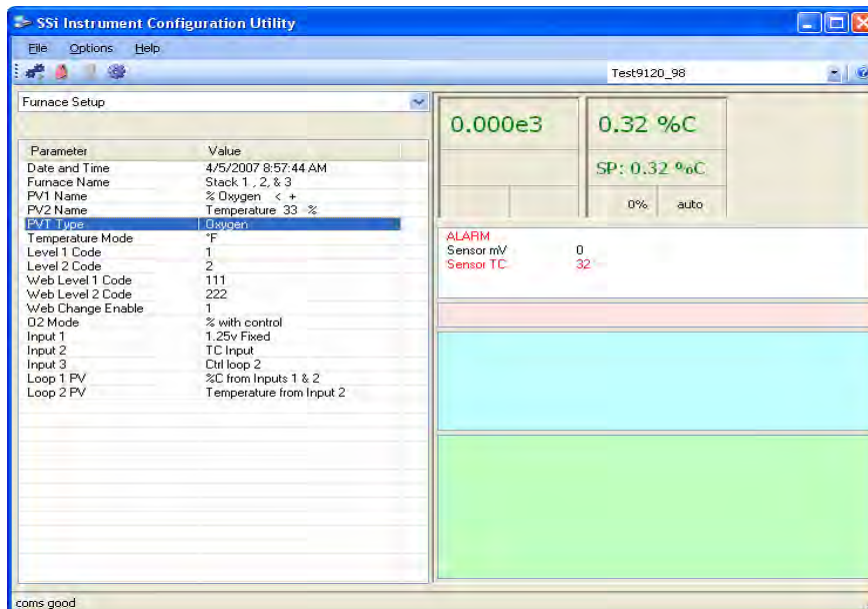
Burnoff Setup

*** This menu option is the same as the menu option *Probe Burnoff Setup* under the *Configurator-9200 Drop-Down Menu*. ***

PID Loop Setup

*** This menu option is the same as the menu option *PID Loop Setup* under the *Configurator-9200 Drop-Down Menu*. The loops are either **Loop 1 – O₂**, or **Loop 2 – Temperature**. ***

Furnace Setup



Configurator – Furnace Setup menu option

The Furnace Setup menu option is an administrative access only option. Do not make any adjustments on this screen without first contacting Super Systems Inc.

Date and Time:

This option will display the current date and time on the 9120 controller. From this menu option, the user can change the date/time *on the 9120 controller*.

Furnace Name:

This value will define the name of the furnace. Clicking on the "Value" column will bring up an input box where the user can enter the furnace's name.

PV1 Name:

This value will define the name of the first process variable. Clicking on the "Value" column will bring up an input box where the user can enter the PV's name.

PV2 Name:

This value will define the name of the second process variable. Clicking on the "Value" column will bring up an input box where the user can enter the PV's name.

PVT Type:

The PVT type is the mode the device runs in (Carbon, Dewpoint, etc.). The mode selected determines the calculations and scaling for the Process Variable. Any time this selection is changed it is necessary to reset the factory defaults to ensure all parameters have been changed to the new Process Variable. Clicking on this value will display an input box with a drop-down list from which the user can select a new PVT Type. The values for the PVT type are: **% Carbon, Dew Point, Oxygen, Millivolt, or Redundant Probe**.


Temperature Mode:

This value determines the specific temperature scale to be used. It can be either Degrees °F or degrees °C.

Level 1 Code:

Typically, operations used by a supervisor require a level 1 code for access. When a supervisor is logged in, the lock on the toolbar will be gold, . To change the level 1 passcode, click on the "Level 1 Code" value (range is **–32768 to 32767**) and an input box will be displayed where the user can select a new value.

Level 2 Code:

Typically, operations used by an administrator require a level 2 code for access. When an administrator is logged in, the lock on the toolbar will be green, . To change the level 2 passcode, click on the "Level 2 Code" value (range is **–32768 to 32767**) and an input box will be displayed where the user can select a new value.

Web Level 1 Code:

This value is the supervisor-level passcode for any web-based operations with the 9120 controller. The range for the passcode is **0 to 9999**.

Web Level 2 Code:

This value is the administrator-level passcode for any web-based operations with the 9120 controller. The range for the passcode is **0 to 9999**.

Web Change Enable:

This will either enable or disable the web change feature, which will allow changes to be made over the web page for the 9120 controller. Select either a **0** (Web Change Disable) or a **1** (Web Change Enable).

O2 Mode:

This value will allow the operator to select the oxygen mode. The options are: **% with control**, **monitor**, or **offset with control**.

Input 1:

This value will display the Input 1 type. This value cannot be changed from this screen.

Input 2:

This value will display the Input 2 type. This value cannot be changed from this screen.

Input 3:

This value will display the Input 3 type. This value cannot be changed from this screen.

Loop 1 PV:

This value will display the Loop 1 PV type. This value cannot be changed from this screen.

Loop 2 PV:

This value will display the Loop 2 PV type. This value cannot be changed from this screen.

Communications Setup

*** This menu option is a combination of the menu option *Port Setup* and *IP Address* under the *Configurator-9200 Drop-Down Menu*. ***

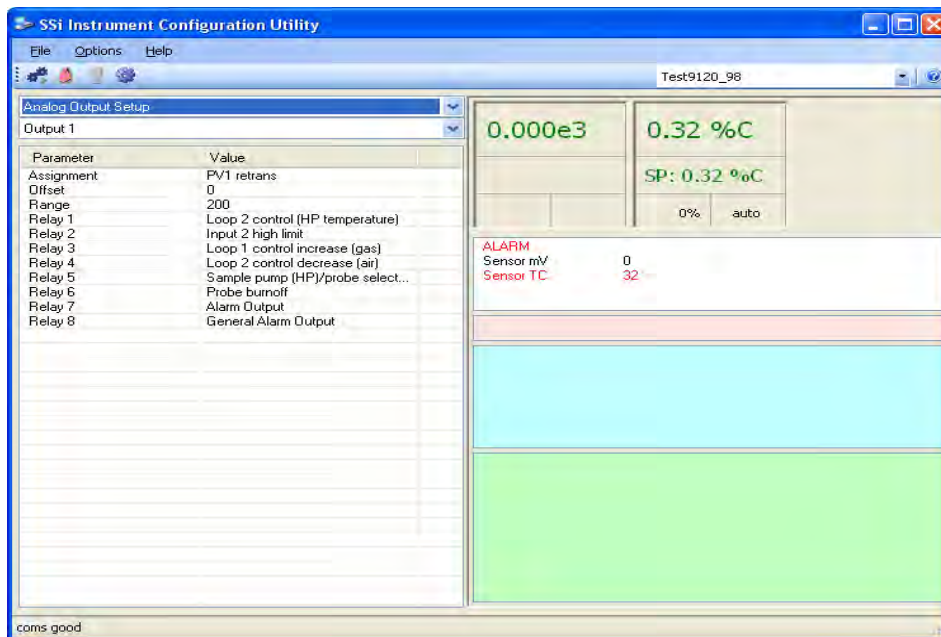
Slave Instrument Setup

*** This menu option is the same as the menu option *Slave Instrument Setup* under the *Configurator-9220 Drop-Down Menu*. ***

Analog Input Setup

*** This menu option is the same as the menu option *Analog Input Setup* under the *Configurator-9200 Drop-Down Menu*. ***

Analog Output Setup



Configurator – Analog Output Setup menu option

The controller has the option of two analog outputs. The outputs are ranged for a 4 – 20 milliamp signal or a 0 – 20 milliamp signal. Each output comes with a factory default configuration dependent on the application. Each output can be modified prior to shipment to your facility or in the field by a supervisor.

Analog Output Terminals:

Analog output 1 – terminals 24 and 25

Analog output 2 – terminals 25 and 26

Assignment:

The analog output assignment can be modified depending on your system requirements. To change the Assignment first select which analog output you want to change by selecting it in the pull-down menu just below the main menu list. Clicking on this value will display an input box, and then you can use the pull-down menu to select the desired parameter. Once selected click **OK** and the displayed assignment under Value will be the current assignment type. The following is a list of the options:

PV 1 retrans	Loop 2 combo
Loop 1 inc	Input 1 retrans
Loop 1 dec	Input 2 retrans
Loop 1 combo	O2 offset log
PV 2 retrans	SP1 retrans
Loop 2 inc	SP2 retrans
Loop 2 dec	

Offset:

This is the starting point, the Process Variable value at which you get 4 milliamps. Clicking on this value will display an input box from which the user can select a new value. The range is – **32768** to **32767**.

Range:

This is a Process Variable value between 4 and 20 milliamps. Clicking on this value will display an input box from which the user can select a new value. The range is –**32768** to **32767**.

Relay 1 – Relay 8:

This value will display what the relay is assigned as. The value cannot be changed from this menu option.

Alarm Setup

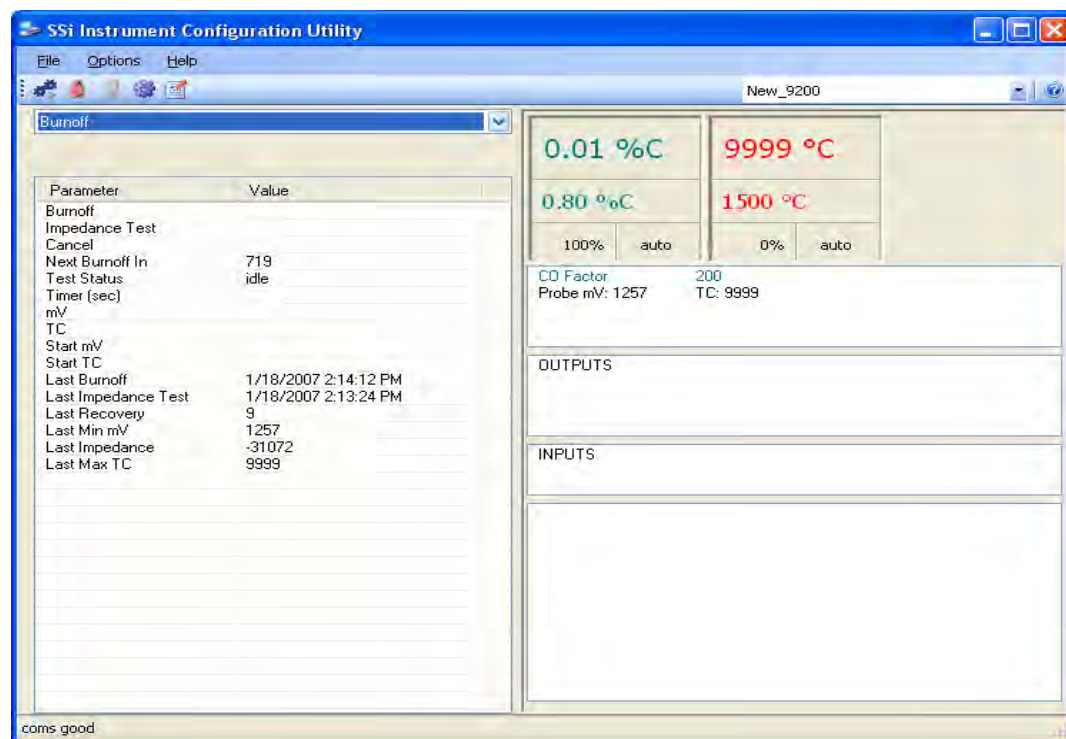
*** This menu option is similar to the menu option *Alarm Setup* under the *Configurator-9220 Drop-Down Menu*. ***

Calibration

*** This menu option is similar to the menu option *SSi Configuration and Calibration* under the *Configurator-9200 Drop-Down Menu*. ***

Configurator-9200 Drop-Down Menu

Burnoff

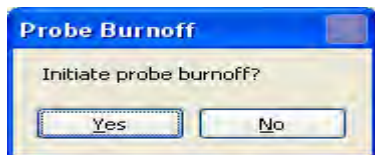


Configurator - Burnoff menu option

When a probe is in a furnace, soot will collect in the end of the probe, which will have a negative effect on the performance of the probe. Burnoffs are used to clean out the built-up carbon by burning it off of the probe.

Burnoff:

Clicking on this value allows users to manually initiate burnoff procedure. The user will have to confirm this action

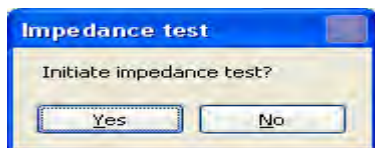


Configurator – Confirm burnoff

The “Test Status” will show that a burnoff is in progress.

Impedance Test:

Clicking on this value manually turns on/off the impedance test (this can *only* be initiated manually). This test lasts 30 seconds. The user will have to confirm the action.

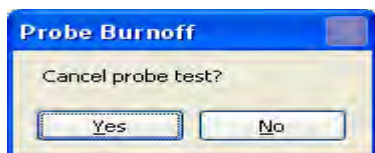


Configurator – Confirm impedance test

The “Test Status” will then become “Impedance Test”.

Cancel:

Clicking on this value will manually turn off both the burnoff and the impedance test. The user will have to confirm this action.



Configurator – Confirm cancellation

Next Burnoff: (shown in minutes):

This value is a displayed calculation based on the burnoff time set in the *Probe Burnoff Setup* menu option. It displays the number of minutes until the next burnoff will be initiated.

Test Status:

This value displays the current testing status. The list of possible values are: **Burnoff, Burnoff Recovery, Idle, Impedance Recovery, or Impedance**

Timer:

This value shows the remaining time, in seconds, for the Burnoff / Impedance Test / Recoveries.

MV:

This value is a display of the current millivolt input value during a burnoff or impedance test.

TC:

This value is a display of the current probe thermocouple input value during a burnoff or impedance test.

Start mV:

This value is a display of the millivolt input value at the beginning of the Burnoff or impedance test.

.

Start TC:

This value is a display of the probe thermocouple value at the beginning of the burnoff or impedance test.

Last Burnoff:

This value shows the date and time of the last burnoff.

Last Impedance Test:

This value shows the date and time of the last Impedance test.

Last Recovery:

This value is a display of the time in seconds it took the millivolt input to return to 1% of the Start mV.

Last Min mV:

This value is a display of the minimum millivolts measured during the last burnoff or impedance test.

Last Impedance:

This value is a display of the measured resistance, in Kohms, after the last impedance test.

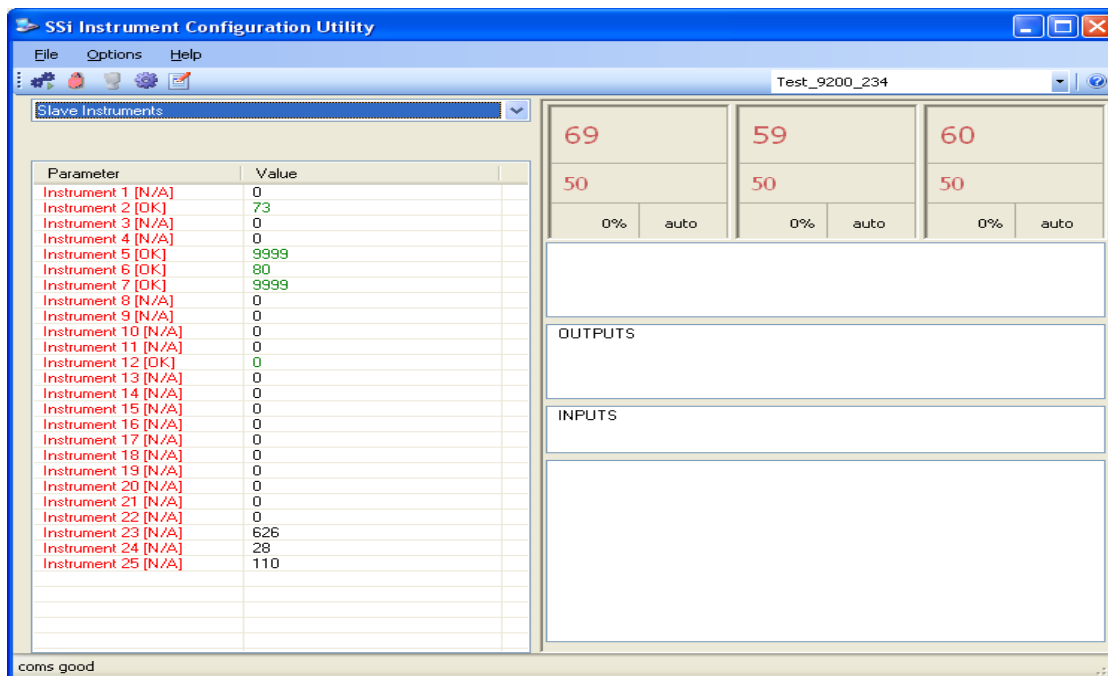
Last Max TC:

This value is a display of the maximum measured probe thermocouple input value during the last burnoff.

Slave Instruments

This page is a display of the current process variables of each of the slave instruments communicating with the 9200 dual loop controller. *Note – None of these values can be modified on this screen.*

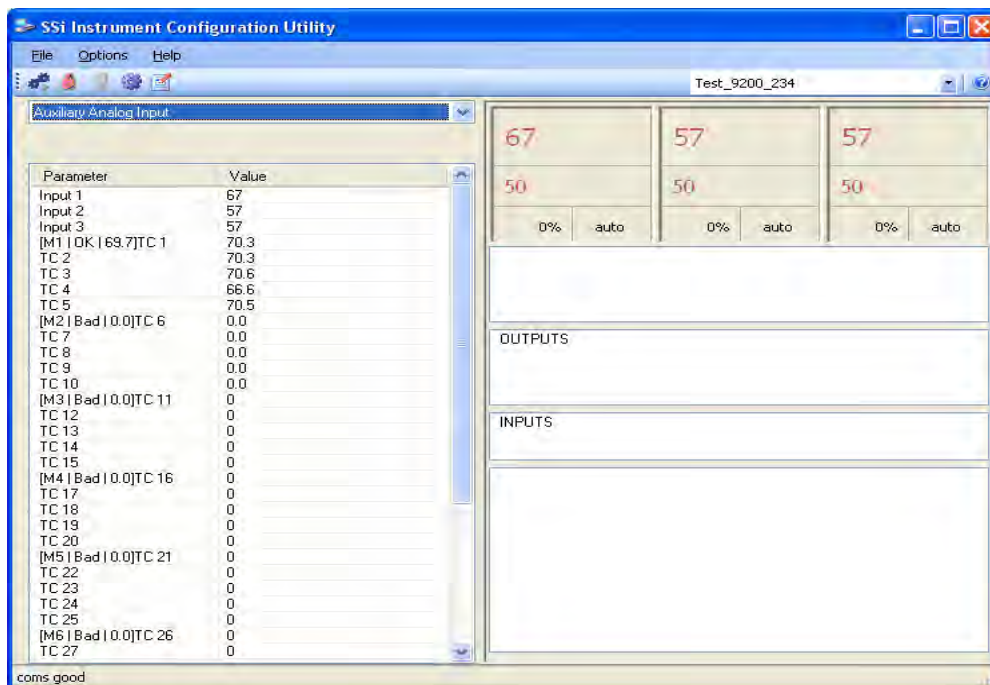
For set-up of the auxiliary instruments go to the menu item "*Slave Instrument Setup*"



Configurator - Slave Instruments menu option

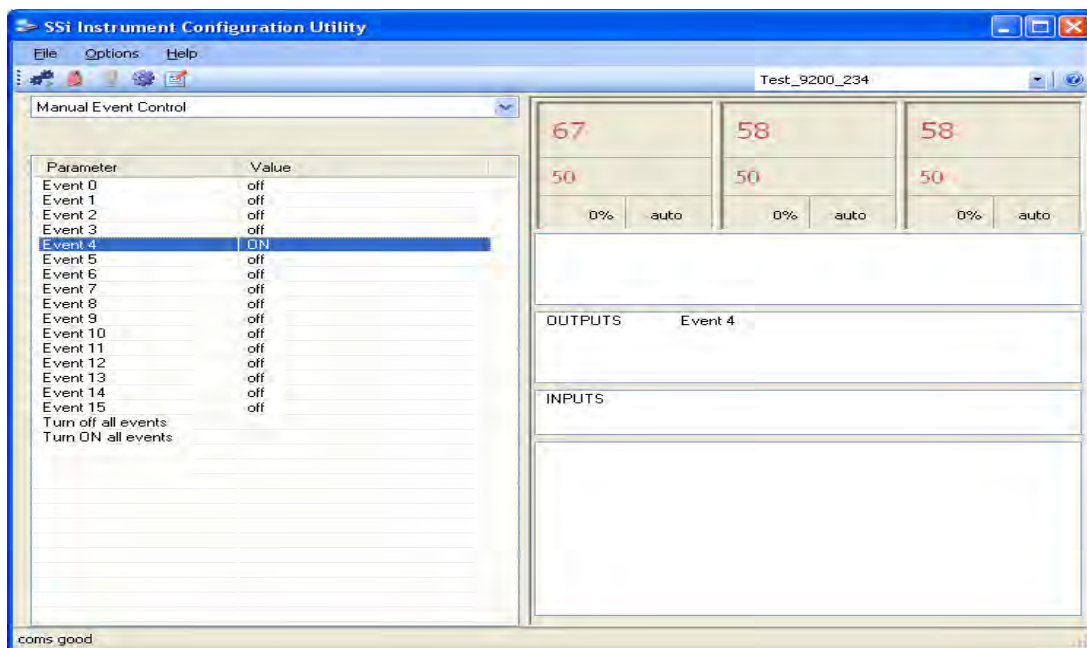
Auxiliary Analog Input

This menu option shows the process variables for the 3 analog inputs of the 9200 dual loop controller. It also shows the input types and any information from attached slave analog input modules. *Note – None of these values can be modified on this screen.*



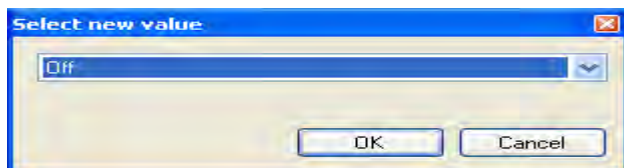
Configurator - Auxiliary Analog Input menu option

Manual Event Control



Configurator – Manual Event Control menu option

The Manual Event Control menu option in the 9200 Series Configurator software shows the user all of the events (0 – 15) and their current status. It also allows the user to manually control the status of any event by clicking on the value. A single click will display an input box that will allow the user to select either an **On** value or an **Off** value.



Configurator – Select Manual Event Control value

Clicking on the **OK** button will set the value, while clicking on the **Cancel** button will cancel the action.

Clicking on the "Value" section of the "Turn off all events" field will force all of the events to **Off** status. The user will have to confirm this action.



Configurator – Confirm force off

Clicking on the **Yes** button will set the action, while clicking on the **No** button will cancel the action.

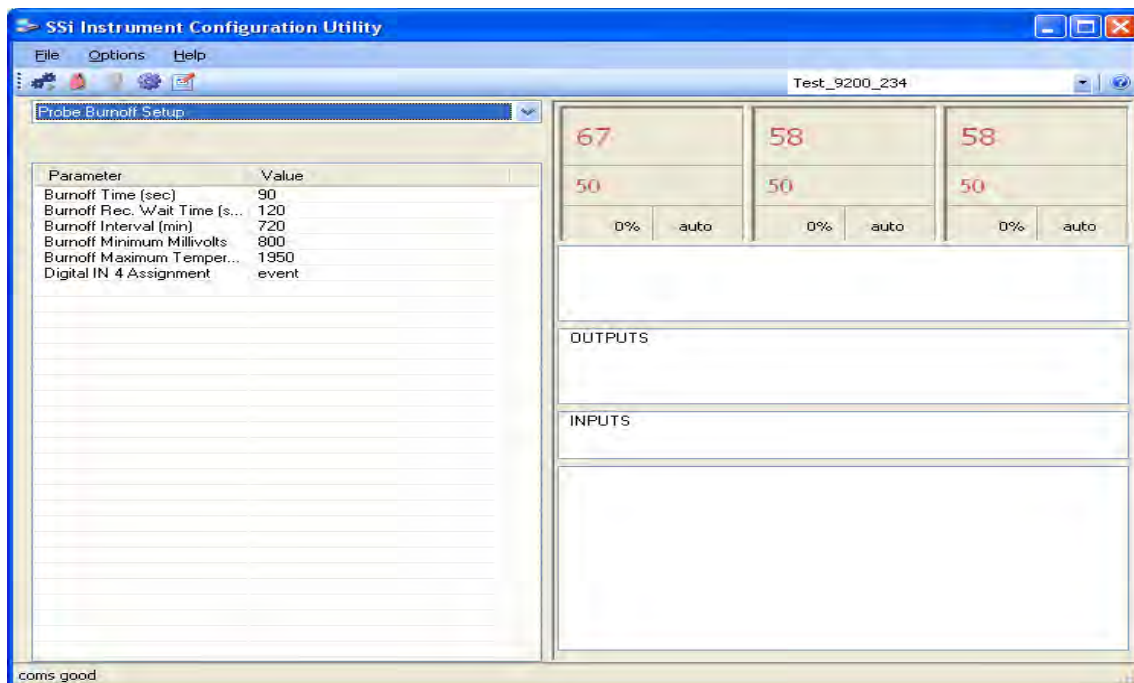
Clicking on the "Value" section of the "Turn ON all events" field will force all of the events to **On** status. The user will have to confirm this action.



Configurator – Confirm force on

Clicking on the **Yes** button will set the action, while clicking on the **No** button will cancel the action.

Probe Burnoff Setup

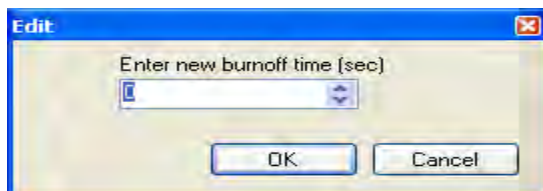


Configurator – Probe Burnoff Setup menu option

This menu option allows the user to modify the settings that are associated with the probe burnoff (menu option *Burnoff*).

Burnoff Time:

The amount of time from the beginning of the burnoff to the end of the burnoff measured in seconds. Clicking on the value will allow the user to change the value.



Configurator – Enter new burnoff value

Click on the **OK** button to set the new value, or click on the **Cancel** button to cancel.

Burnoff Recovery Wait Time:

The amount of time allotted to allow the probe measurements to return to a stable, accurate range after the burnoff is complete. This is measured in seconds. The control output is held until this time is elapsed. Clicking on the value will allow the user to change the value.

Burnoff Interval:

The amount of time between the beginning of one burnoff and the beginning of the next scheduled burnoff measured in minutes. Clicking on the value will allow the user to change the value.

Burnoff Minimum Millivolts:

The minimum measured millivolt tolerance of the probe required to start a burnoff. Clicking on the value will allow the user to change the value.

Burnoff Maximum Temperature:

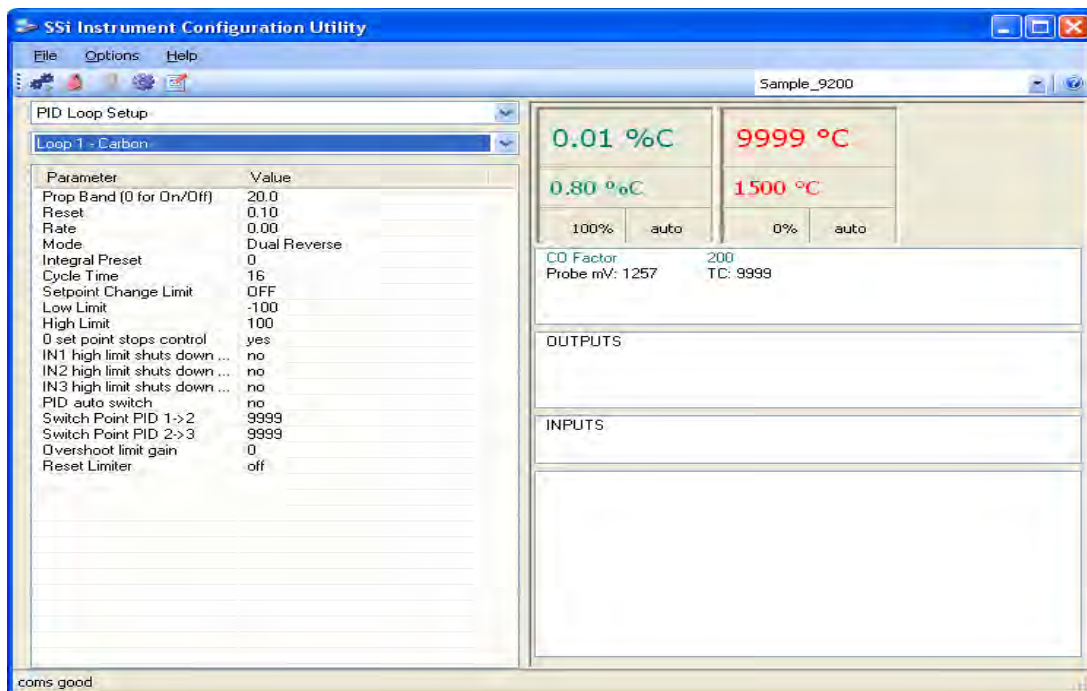
The maximum measured temperature allowed during a burnoff. If the temperature value is exceeded ***the burnoff will stop***. This is done to help maintain the life and the accuracy of your probe. Clicking on the value will allow the user to change the value.

Digital IN 4 Assignment:

The value for the digital input 4 assignment. Clicking on the value will allow the user to change the value, which can be either **event** or **start BO**.

PID Loop Setup

PID is the tuning parameters entered for each Process Variable loop. The loop value can either be **Loop 1**, **Loop 2**, or **Loop 3**.



Configurator – PID Loop Setup menu option

Prop Band (0 for On/Off)

This is the proportional band field. The range 0 – 999.0

Reset

This is the reset field. The range 0 – 100.00

Rate

This is the rate field. The range is 0 – 100.00. The rate is not typically used for heating/carbon

Mode

This is the mode of the loop. The values are: **Dual Reverse**, **Single Reverse**, **Dual Direct**, or **Single Direct**.

Integral Preset

This field provides an offset for the starting point for PID control, also referred to as “Load Line” or “Manual Reset”. The range is **–100** to **100**.

Cycle Time

This field is typically set to the valve travel time multiplied by 1.5.

Setpoint Change Limit

This is a smart time feature that allows Process Loop to use PB only without Reset until the Process Variable drops below the percent output set under this category.

It is used to eliminate overshoot.

The Output percentage selected under this category **must** be above the normal operating output percentage of the furnace at heat.

Example – if the furnace runs at 40% output at heat for the maximum load, the setpoint change limit should be set to 60%.

Low Limit

This is the low limit field. The range is **–100** to **100**.

High Limit

This is the high limit field. The range is **–100** to **100**.

0 Setpoint Stops Control

If the Setpoint is zero, then all outputs are turned off. The option is either **Yes** or **No**.

IN1 high limit shuts down ctrl

If input 1's high limit is reached, then all outputs are turned off. The value can either be **Yes** or **No**.

IN2 high limit shuts down ctrl

If input 2's high limit is reached, then all outputs are turned off. The value can either be **Yes** or **No**.

IN3 high limit shuts down ctrl

If input 3's high limit is reached, then all outputs are turned off. The value can either be **Yes** or **No**.

PID Auto Switch

This is the PID auto switch field. The value can either be **Yes** or **No**.

Switch Point PID 1 -> 2

This is the PID Switch Point field. The range is **–300** to **4000**.

Switch Point PID 2 -> 3

This is the PID Switch Point field. The range is **–300** to **4000**.

Overshoot Limit Gain

This is the Overshoot limit gain field. The range is **0** to **9999**.

Reset Limiter

This is the reset limiter field. The values can either be **On** or **Off**.

Factory Default Configuration:

Carbon:

Loop 1 Prop Band (DB ON/ OFF)	20.0
LP 1 Reset	0.10
LP 1 Rate	0.00
LP 1 Mode	Dual Reverse
LP 1 Integral Preset	0
LP 1 Cycle Time	16

LP 1 Low Limit	-100
LP1 High Limit	100
LP 1 Zero SP stops control	YES

Loop 2 Prop Band (DB ON/ OFF)	4.0
LP 2 Reset	0.10
LP 2 Rate	0.00
LP 2 Mode	Single Reverse
LP 2 Integral Preset	0
LP 2 Cycle Time	60
LP 2 Low Limit	0
LP 2 High Limit	100
LP 2 Zero SP stops control	NO

Loop 3 Prop Band (DB ON/ OFF)	4.0
LP 3 Reset	0.10
LP 3 Rate	0.00
LP 3 Mode	Single Reverse
LP 3 Integral Preset	0
LP 3 Cycle Time	60
LP 3 Low Limit	0
LP 3 High Limit	100
LP 3 Zero SP stops control	NO

Dewpoint:

Loop 1 Prop Band (DB ON/ OFF)	20.0
LP 1 Reset	0.10
LP 1 Rate	0.00
LP 1 Mode	Dual Direct
LP 1 Integral Preset	0
LP 1 Cycle Time	16
LP 1 Low Limit	-100
LP1 High Limit	100
LP 1 Zero SP stops control	NO

Loop 2 Prop Band (DB ON/ OFF)	4.0
LP 2 Reset	0.10
LP 2 Rate	0.00
LP 2 Mode	Single Reverse
LP 2 Integral Preset	0
LP 2 Cycle Time	60
LP 2 Low Limit	0
LP 2 High Limit	100
LP 2 Zero SP stops control	NO

Loop 3 Prop Band (DB ON/ OFF)	4.0
-------------------------------	-----

LP 3 Reset	0.10
LP 3 Rate	0.00
LP 3 Mode	Single Reverse
LP 3 Integral Preset	0
LP 3 Cycle Time	60
LP 3 Low Limit	0
LP 3 High Limit	100
LP 3 Zero SP stops control	NO

%02:

Loop 1 Prop Band (DB ON/ OFF)	20.0
LP 1 Reset	0.10
LP 1 Rate	0.00
LP 1 Mode	Single Reverse
LP 1 Integral Preset	0
LP 1 Cycle Time	16
LP 1 Low Limit	0
LP1 High Limit	100
LP 1 Zero SP stops control	NO

Loop 2 Prop Band (DB ON/ OFF)	4.0
LP 2 Reset	0.10
LP 2 Rate	0.00
LP 2 Mode	Single Reverse
LP 2 Integral Preset	0
LP 2 Cycle Time	60
LP 2 Low Limit	0
LP 2 High Limit	100
LP 2 Zero SP stops control	NO

Loop 3 Prop Band (DB ON/ OFF)	4.0
LP 3 Reset	0.10
LP 3 Rate	0.00
LP 3 Mode	Single Reverse
LP 3 Integral Preset	0
LP 3 Cycle Time	60
LP 3 Low Limit	0
LP 3 High Limit	100
LP 3 Zero SP stops control	NO

mV:

Loop 1 Prop Band (DB ON/ OFF)	20.0
LP 1 Reset	0.10
LP 1 Rate	0.00
LP 1 Mode	Dual Reverse
LP 1 Integral Preset	0

LP 1 Cycle Time	16
LP 1 Low Limit	-100
LP1 High Limit	100
LP 1 Zero SP stops control	YES

Loop 2 Prop Band (DB ON/ OFF)	4.0
LP 2 Reset	0.10
LP 2 Rate	0.00
LP 2 Mode	Single Reverse
LP 2 Integral Preset	0
LP 2 Cycle Time	60
LP 2 Low Limit	0
LP 2 High Limit	100
LP 2 Zero SP stops control	NO

Loop 3 Prop Band (DB ON/ OFF)	4.0
LP 3 Reset	0.10
LP 3 Rate	0.00
LP 3 Mode	Single Reverse
LP 3 Integral Preset	0
LP 3 Cycle Time	60
LP 3 Low Limit	0
LP 3 High Limit	100
LP 3 Zero SP stops control	NO

Multiloop:

Loop 1 Prop Band (DB ON/ OFF)	20.0
LP 1 Reset	0.10
LP 1 Rate	0.00
LP 1 Mode	Single Reverse
LP 1 Integral Preset	0
LP 1 Cycle Time	60
LP 1 Low Limit	0
LP1 High Limit	100
LP 1 Zero SP stops control	NO

Loop 2 Prop Band (DB ON/ OFF)	4.0
LP 2 Reset	0.10
LP 2 Rate	0.00
LP 2 Mode	Single Reverse
LP 2 Integral Preset	0
LP 2 Cycle Time	60
LP 2 Low Limit	0
LP 2 High Limit	100
LP 2 Zero SP stops control	NO

Loop 3 Prop Band (DB ON/ OFF)	4.0
LP 3 Reset	0.10
LP 3 Rate	0.00
LP 3 Mode	Single Reverse
LP 3 Integral Preset	0
LP 3 Cycle Time	60
LP 3 Low Limit	0
LP 3 High Limit	100
LP 3 Zero SP stops control	NO

Vacuum:

Loop 1 Prop Band (DB ON/ OFF)	20.0
LP 1 Reset	0.10
LP 1 Rate	0.00
LP 1 Mode	Single Reverse
LP 1 Integral Preset	0
LP 1 Cycle Time	16
LP 1 Low Limit	0
LP1 High Limit	100
LP 1 Zero SP stops control	NO

Loop 2 Prop Band (DB ON/ OFF)	4.0
LP 2 Reset	0.10
LP 2 Rate	0.00
LP 2 Mode	Single Reverse
LP 2 Integral Preset	0
LP 2 Cycle Time	60
LP 2 Low Limit	0
LP 2 High Limit	100
LP 2 Zero SP stops control	NO

Loop 3 Prop Band (DB ON/ OFF)	4.0
LP 3 Reset	0.10
LP 3 Rate	0.00
LP 3 Mode	Single Reverse
LP 3 Integral Preset	0
LP 3 Cycle Time	60
LP 3 Low Limit	0
LP 3 High Limit	100
LP 3 Zero SP stops control	NO

IR + Probe:

Loop 1 Prop Band (DB ON/ OFF)	20.0
LP 1 Reset	0.10
LP 1 Rate	0.00
LP 1 Mode	Dual Reverse

LP 1 Integral Preset	0
LP 1 Cycle Time	16
LP 1 Low Limit	-100
LP1 High Limit	100
LP 1 Zero SP stops control	YES

Loop 2 Prop Band (DB ON/ OFF)	4.0
LP 2 Reset	0.10
LP 2 Rate	0.00
LP 2 Mode	Single Reverse
LP 2 Integral Preset	0
LP 2 Cycle Time	60
LP 2 Low Limit	0
LP 2 High Limit	100
LP 2 Zero SP stops control	NO

Loop 3 Prop Band (DB ON/ OFF)	4.0
LP 3 Reset	0.10
LP 3 Rate	0.00
LP 3 Mode	Single Reverse
LP 3 Integral Preset	0
LP 3 Cycle Time	60
LP 3 Low Limit	0
LP 3 High Limit	100
LP 3 Zero SP stops control	NO

Nitridr:

Loop 1 Prop Band (DB ON/ OFF)	20.0
LP 1 Reset	0.10
LP 1 Rate	0.00
LP 1 Mode	Single Reverse
LP 1 Integral Preset	0
LP 1 Cycle Time	16
LP 1 Low Limit	-100
LP1 High Limit	100
LP 1 Zero SP stops control	YES

Loop 2 Prop Band (DB ON/ OFF)	4.0
LP 2 Reset	0.10
LP 2 Rate	0.00
LP 2 Mode	Single Reverse
LP 2 Integral Preset	0
LP 2 Cycle Time	60
LP 2 Low Limit	0
LP 2 High Limit	100
LP 2 Zero SP stops control	NO

Loop 3 Prop Band (DB ON/ OFF)	4.0
LP 3 Reset	0.10
LP 3 Rate	0.00
LP 3 Mode	Single Reverse
LP 3 Integral Preset	0
LP 3 Cycle Time	60
LP 3 Low Limit	0
LP 3 High Limit	100
LP 3 Zero SP stops control	NO

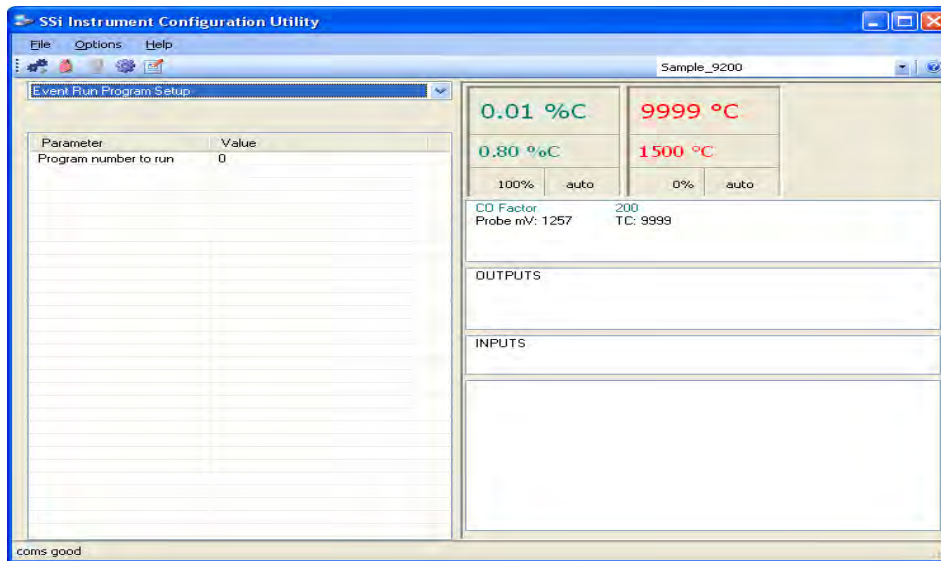
%C Dual T/C:

Loop 1 Prop Band (DB ON/ OFF)	20.0
LP 1 Reset	0.10
LP 1 Rate	0.00
LP 1 Mode	Dual Reverse
LP 1 Integral Preset	0
LP 1 Cycle Time	16
LP 1 Low Limit	-100
LP1 High Limit	100
LP 1 Zero SP stops control	YES

Loop 2 Prop Band (DB ON/ OFF)	4.0
LP 2 Reset	0.10
LP 2 Rate	0.00
LP 2 Mode	Single Reverse
LP 2 Integral Preset	0
LP 2 Cycle Time	60
LP 2 Low Limit	0
LP 2 High Limit	100
LP 2 Zero SP stops control	NO

Loop 3 Prop Band (DB ON/ OFF)	4.0
LP 3 Reset	0.10
LP 3 Rate	0.00
LP 3 Mode	Single Reverse
LP 3 Integral Preset	0
LP 3 Cycle Time	60
LP 3 Low Limit	0
LP 3 High Limit	100
LP 3 Zero SP stops control	NO

Event Run Program Setup



Configurator – Event Run Program Setup menu option

Event run program setup is used to start a program that is stored in the 9200 dual loop controller (zero for buffered) or by a defined event input.

*Program must be configured under the menu option *Event Control*

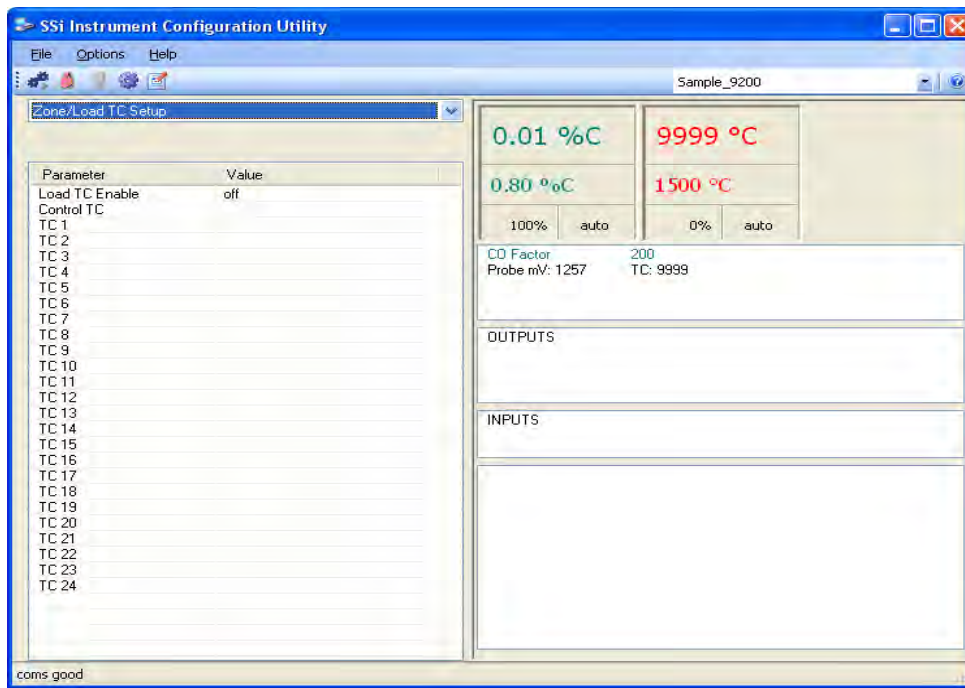
*Used to define an event input to initiate a program start and to define which program to start (zero starts the last program run) from the contact closure. The range of programs to run is 0 to 300.

WARNING

If a JUMP (to another program) is used in a previous program, the program that will run would be the last program jumped to not the first program run.

If you stop a program in a GOSUB the program that will be run will be the GOSUB.

Zone/Load TC Setup



Configurator – Zone/Load TC Setup menu option

Configuration of any analog input device must be completed with this menu item.

Load TC Enable

This value will manually toggle between **on**, **on + alarms**, and **off**.

On – T/C Enabled

On + alarms – T/C Enabled, Programmer alarm114 provided if out of band (Default wait limits)

Off – T/C not enabled

Control TC

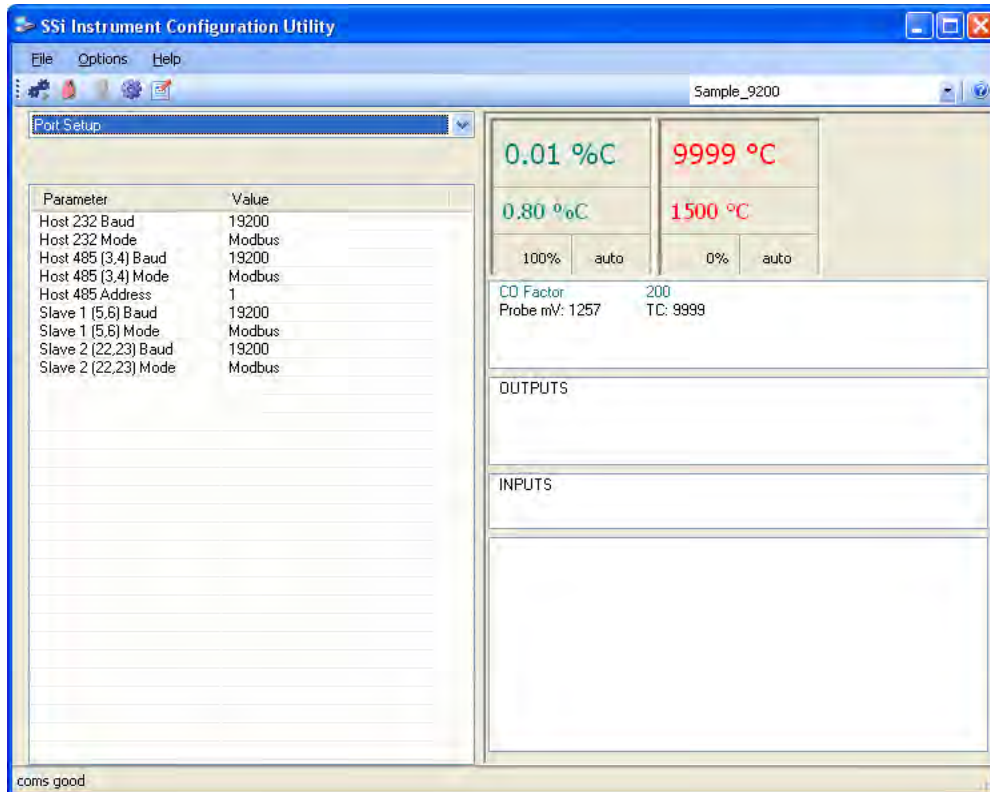
This value allows the user to set the TC to be part of the group of Load TCs that can hold the program if it is out of band. The values are **active** or **not active**, shown as blank

TC 1 - 24

This value allows the user to manually turn the T/C from **active** to **not active**, shown as blank, to be part of the group of TCs that can hold the program if it's out of band

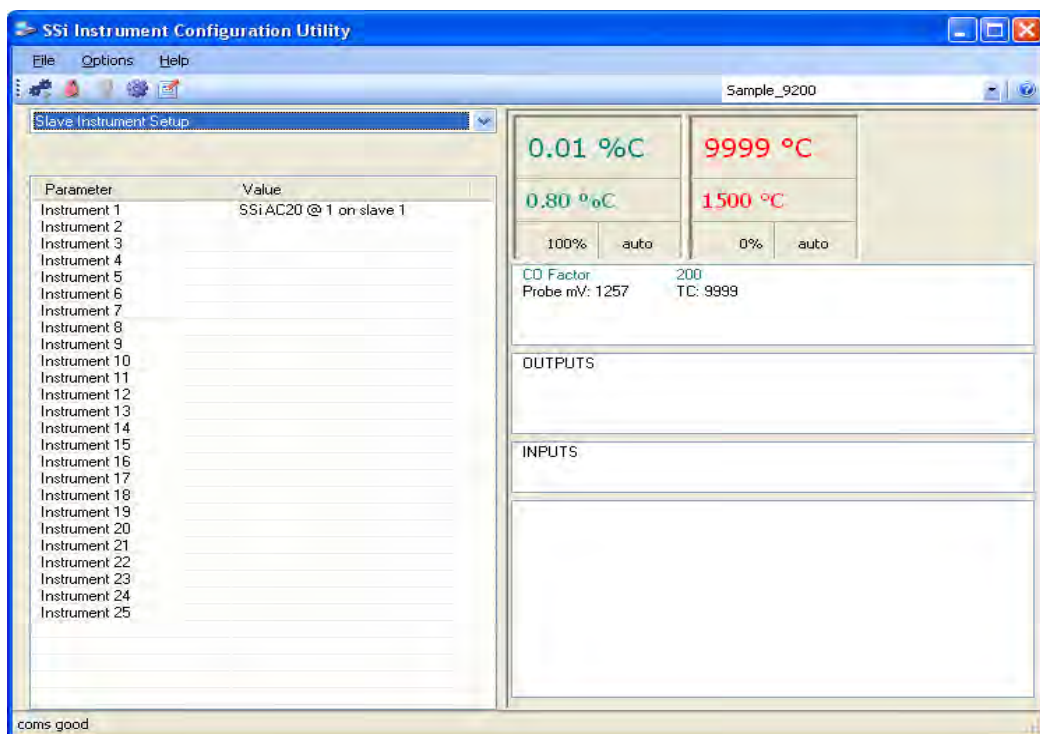
Port Setup

Port setup is the communications definitions for the controller. Please contact Super Systems Inc. for more information regarding port setup. It is *strongly recommended* that none of the settings be modified without technical support from Super Systems Inc. Clicking on any of the values will display an input box that will allow the user to modify the current settings.



Configurator - Port Setup menu option

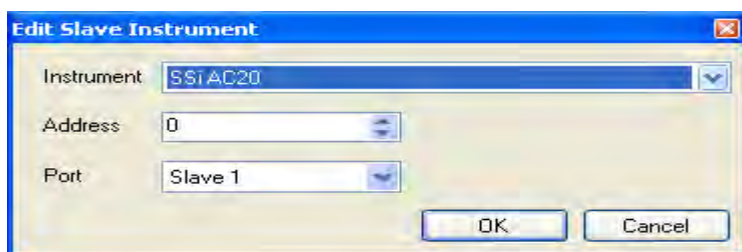
Slave Instrument Setup



Configurator - Instrument Setup menu option

** All devices on the same slave port must utilize the same protocol
** An address of zero (0) will disable the instrument** Some controllers (AC20 for example) can provide dual functions (atmosphere and events) and must have the same address assigned for both.

Clicking on the "Value" field for any instrument will allow the user to select the slave instrument.



Configurator – Edit Slave Instrument screen

Instrument:

This value will allow the user to select the slave instrument type.

Atmosphere Controllers:

Atmosphere controllers will have an [A] in front of the name

SSI AC20	Eurotherm 2404
Yokagowa 750	Eurotherm 2500

Honeywell UDC 3300	Carbpro v3.5
Dualpro 1 modbus	Carbpro v3.0
Dualpro 2 modbus	Carb PC
Dualpro 1 MMI	9200 LP1
Dualpro 2 MMI	IR Base

Temperature Controllers:

Temperature controllers will have a [T] in front of the name

SSI 7EK	9200 LP1
Yokagowa 750	9200 LP2
Honeywell UDC 3300	9200 LP3
Dualpro 1 modbus	9100 LP2
Dualpro 2 modbus	Eurotherm 2704 ip1
Dualpro 1 MMI	Eurotherm 2704 ip2
Dualpro 2 MMI	Eurotherm 2704 ip3
Eurotherm 2404	VC base 1
Eurotherm 2500	VC base 2
Unipro v 3.5	VC base 3
Unipro v 3.0	VC base 4
Carbpro v3.5 slave	AIPC
Carbpro v3.0 slave	SSI 7SL
10pro	SSI Flow Board
Dualpro in C	UMD 800 LP1

Event controllers:

SSI AC E	Carbpro E v3.5
Yokagowa 750 E	Carbpro E v3.0
Mod Mux	Eurotherm 2500
Dualpro E Modbus	Ssi 8-8
Dualpro E MMI	

Address:

This value allows the user to select the address that corresponds with the controller selected, with a range of 0 to 249.

Port:

The options for this field can either be **Slave 1** or **Slave 2**

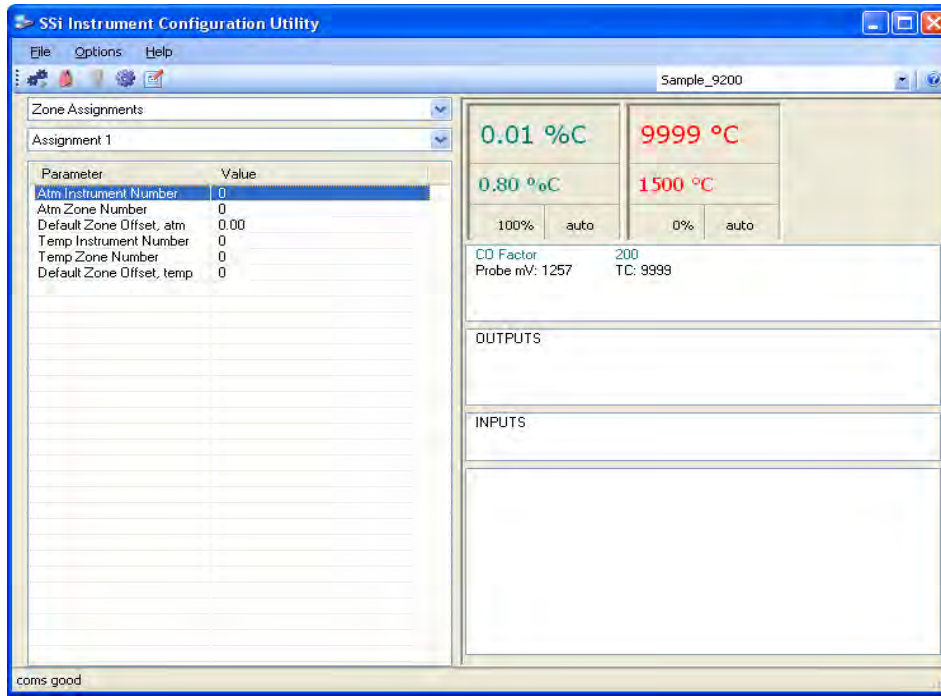
Slave 1 – terminals 5(-), 6(+)

Slave 2 – terminals 22(+), 23(-)

Zone Assignments

A zone assignment on the 9200 dual loop controller allows the recipe programs to change setpoints on all slave instruments of a multi-zone furnace (up to 5 zones).

- *Only used when running recipes
- *Slave Instrument Setup must be configured prior to Zone Assignment setup
- ** Atmosphere zones link instruments to Atmosphere Setpoints
- ** Temperature zones link instruments to Temperature Setpoints



Configurator – Zone Assignments menu option

Assignments:

The zone assignment number, with a choice of **Assignment 1** through **Assignment 5**.

ATM Instrument Number:

The slave instrument number assigned to an atmosphere controller, with a range of **0** to **25**.

ATM Zone Number:

The zone within which the atmosphere setpoint change is desired, with a range of **0** to **5**.

Default Zone Offset, atm:

This is the default zone offset for atmosphere, with a range of **–100.00** to **100.00**.

Temp Instrument Number:

The slave instrument number assigned to a temperature controller, with a range of **0** to **25**.

Temp Zone Number:

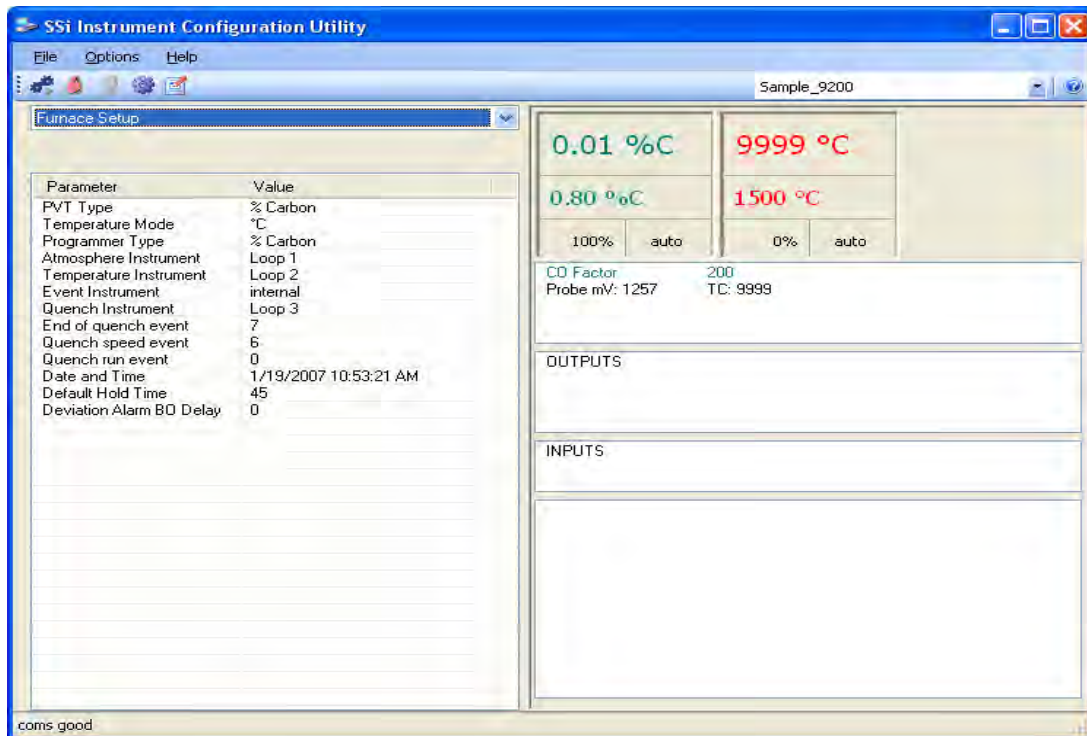
The zone within which the temperature setpoint change is desired, with a range of **0** to **5**.

Default Zone Offset, temp:

This is the default zone offset for temperature, with a range of **–32000** to **32000**.

Furnace Setup

The Furnace Setup menu option is an administrative access only option. Do not make any adjustments on this screen without first contacting Super Systems Inc.



Configurator – Furnace Setup menu option

PVT Type:

The PVT type is the mode the device runs in (Carbon, Dewpoint, etc.). The mode selected determines the calculations and scaling for the Process Variable. Any time this selection is changed it is necessary to reset the factory defaults to ensure all parameters have been changed to the new Process Variable. Clicking on this value will display an input box with a drop-down list from which the user can select a new PVT Type. The values for the PVT type are: **% Carbon, Dew Point, % O2, Millivolts, Multi-loop, Vacuum, IR + Probe, Nitrider, % Carbon + Dual Temp, or Cascade.**

Temperature Mode:

This value determines the specific temperature scale to be used. It can be either Degrees **°F** or degrees **°C**.

Programmer Type:

Displays programmer types and allows for a change in control mode. The values for the Programmer Type are: **% Carbon, Dew Point, % O2, Millivolts, Temperature Only, Dual Temperature, Vacuum, Probe + IR, Nitrider, Carbon + Dual Temperature, or Cascade.**

Atmosphere Instrument:

Allows for a slave instrument (or internal) to be the defined atmosphere control device. The types of instruments are: **Internal Loop 1 – Internal Loop 3, Instrument 1 – Instrument 25.**

Temperature Instrument:

Allows for a slave instrument (or internal) to be the defined temperature control device. The types of instruments are: **Internal Loop 1 – Internal Loop 3, Instrument 1 – Instrument 25.**

Event Instrument:

Allows for a slave instrument (or internal) to be the defined event control device. The types of instruments are: **Internal, Instrument 1 – Instrument 25.**

Quench Instrument:

Allows for slave instrument (or internal) to be the defined quench control device. The types of instruments are: **Internal Loop 1 – Internal Loop 3, Instrument 1 – Instrument 25.**

End of Quench Event:

Tells the programmer which event to signal end of quench (related to which relay it is assigned). The list of possible values is: **0 – 14.**

Quench Speed Event:

Tells the programmer which event will signal the quench speed. The list of possible values is: **0 – 14.**

Quench Run Event:

Tells the programmer which event will signal quench run. The list of possible values is: **0 – 14.**

Date and Time:

Displays the current date and time.

Default Hold Time:

This value is the default holding time for the furnace. The range is **0 to 10000.**

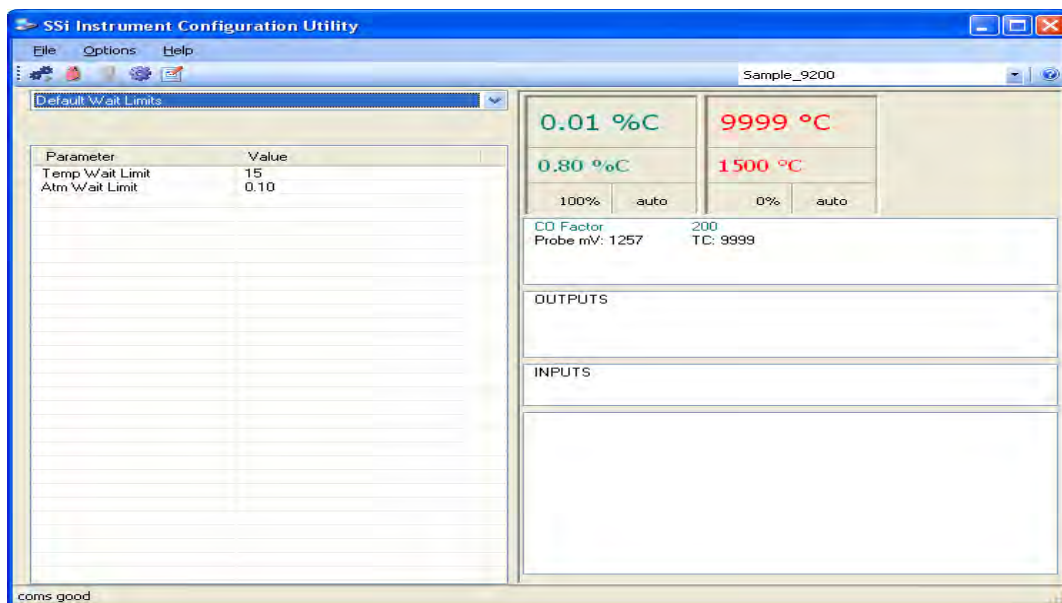
Deviation Alarm BO delay:

This value is the delay for the burnoff if a deviation alarm is detected. The range is **0 to 10000.**

Default Wait Limits

The 9200 dual loop controller uses default wait limits in conjunction with recipe programs. The wait limits are in place to help make sure a recipe will not continue to the next step until the temperature, atmosphere or both are within the specified range. The wait limits are both plus

and minus the value of the setpoint specified in the recipe. You can define specific wait limits per program that supersede the defaults with the specific wait limit OP CODE per program (SETWAIT).



Configurator – Default Wait Limits menu option

Factory Default configuration:

Carbon:

<i>Parameter</i>	<i>Value</i>
Default Wait Limit for Temperature	15
Default Wait Limit for Atmosphere	0.10

Dewpoint:

<i>Parameter</i>	<i>Value</i>
Default Wait Limit for Temperature	15
Default Wait Limit for Atmosphere	10

%O2:

<i>Parameter</i>	<i>Value</i>
Default Wait Limit for Temperature	15
Default Wait Limit for Atmosphere	1.0

MV:

<i>Parameter</i>	<i>Value</i>
Default Wait Limit for Temperature	15
Default Wait Limit for Atmosphere	10

Multiloop:

<i>Parameter</i>	<i>Value</i>
------------------	--------------

Default Wait Limit for Temperature	15
Default Wait Limit for Atmosphere	10

Vacuum:

<i>Parameter</i>	<i>Value</i>
Default Wait Limit for Temperature	15
Default Wait Limit for Atmosphere	10

IR + Probe:

<i>Parameter</i>	<i>Value</i>
Default Wait Limit for Temperature	15
Default Wait Limit for Atmosphere	10

Nitrider:

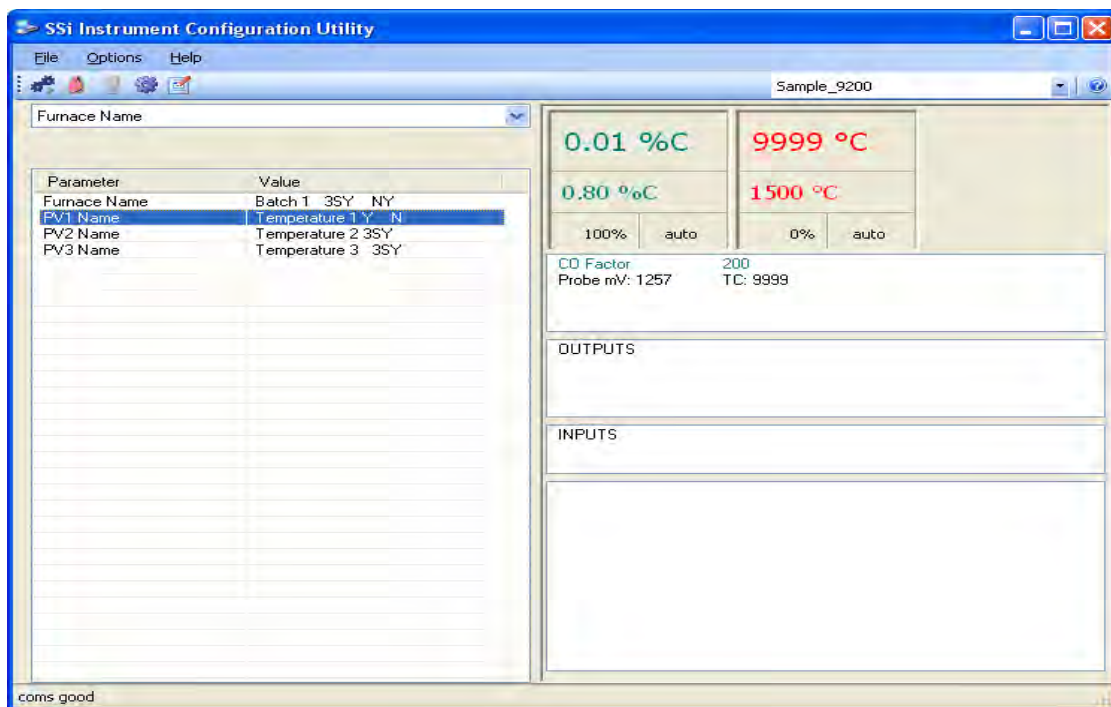
<i>Parameter</i>	<i>Value</i>
Default Wait Limit for Temperature	15
Default Wait Limit for Atmosphere	1.0

%C Dual Temp:

<i>Parameter</i>	<i>Value</i>
Default Wait Limit for Temperature	15
Default Wait Limit for Atmosphere	10

Furnace Name

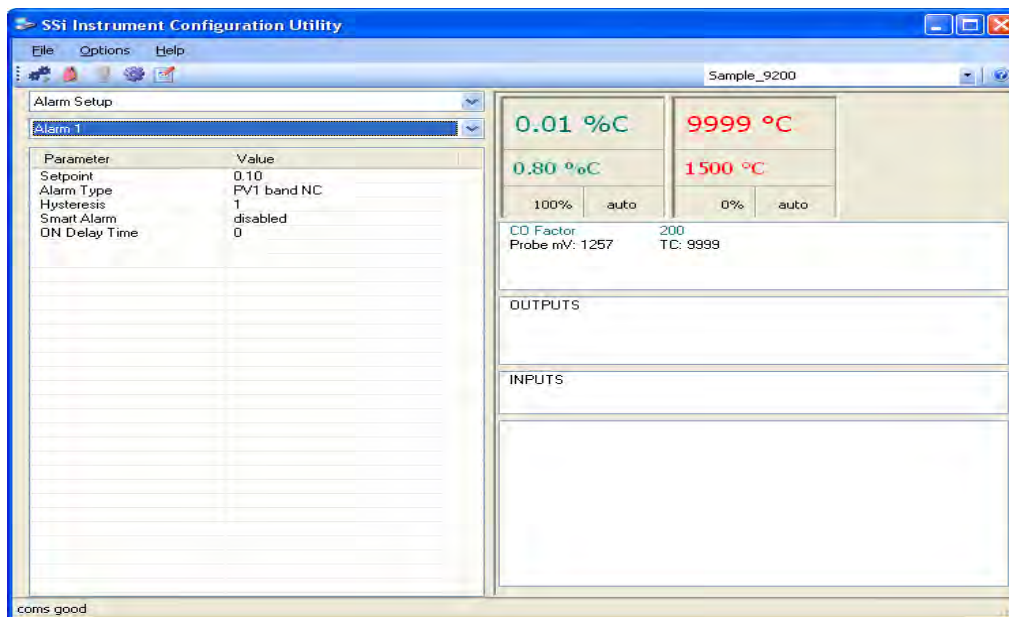
This page allows the user to enter a furnace name and the process variable (PV) names you wish to be displayed. Clicking on any of the values will display an input box. The user can enter the desired text then press **OK**. All values have a maximum length of twenty (20) characters.



Configurator - Furnace Name menu option

Alarm Setup

The 9200 Dual Loop controller can be configured to use three different alarms. Each of the alarms consists of an alarm setpoint, alarm type, alarm hysteresis, smart alarm, and ON delay time. The alarms come from the factory with a default configuration dependent on the application but also can be modified prior to shipment to your facility or in the field by a supervisor.



Configurator – Alarm Setup menu option

Default Configuration:**Carbon:**

<i>Parameter</i>	<i>Value</i>
Alarm 1 setpoint	10
Alarm 1 type	PV 1 NC
Alarm 1 hysteresis	1
Alarm 1 Smart Alarm	Disabled
Alarm 1 ON delay time	0
Alarm 2 setpoint	15
Alarm 2 type	PV 2 NC
Alarm 2 hysteresis	1
Alarm 2 Smart Alarm	Disabled
Alarm 2 ON delay time	0
Alarm 3 setpoint	1400
Alarm 3 type	PV 2 proc high
Alarm 3 hysteresis	1
Alarm 3 Smart Alarm	Disabled
Alarm 3 ON delay time	0

Dewpoint:

<i>Parameter</i>	<i>Value</i>
Alarm 1 setpoint	10
Alarm 1 type	PV 1 dev NC
Alarm 1 hysteresis	1
Alarm 1 Smart Alarm	Disabled
Alarm 1 ON delay time	0
Alarm 2 setpoint	15
Alarm 2 type	PV 2 dev NC
Alarm 2 hysteresis	1
Alarm 2 Smart Alarm	Disabled
Alarm 2 ON delay time	0
Alarm 3 setpoint	1400
Alarm 3 type	PV 2 proc high
Alarm 3 hysteresis	1
Alarm 3 Smart Alarm	Disabled
Alarm 3 ON delay time	0

%O2:

<i>Parameter</i>	<i>Value</i>
Alarm 1 setpoint	100
Alarm 1 type	PV 1 proc high
Alarm 1 hysteresis	0

Alarm 1 Smart Alarm	Disabled
Alarm 1 ON delay time	0
Alarm 2 setpoint	0
Alarm 2 type	PV 1 proc high
Alarm 2 hysteresis	0
Alarm 2 Smart Alarm	Disabled
Alarm 2 ON delay time	0
Alarm 3 setpoint	0
Alarm 3 type	PV 1 proc high
Alarm 3 hysteresis	0
Alarm 3 Smart Alarm	Disabled
Alarm 3 ON delay time	0

mV:

<i>Parameter</i>	<i>Value</i>
Alarm 1 setpoint	10
Alarm 1 type	PV 1 dev NC
Alarm 1 hysteresis	1
Alarm 1 Smart Alarm	Disabled
Alarm 1 ON delay time	0
Alarm 2 setpoint	1
Alarm 2 type	PV 2 dev NC
Alarm 2 hysteresis	1
Alarm 2 Smart Alarm	Disabled
Alarm 2 ON delay time	0
Alarm 3 setpoint	1400
Alarm 3 type	PV 2 proc high
Alarm 3 hysteresis	1
Alarm 3 Smart Alarm	Disabled
Alarm 3 ON delay time	0

Multiloop:

<i>Parameter</i>	<i>Value</i>
Alarm 1 setpoint	0
Alarm 1 type	PV 1 band NC
Alarm 1 hysteresis	1
Alarm 1 Smart Alarm	Disabled
Alarm 1 ON delay time	0
Alarm 2 setpoint	0
Alarm 2 type	PV 2 band NC
Alarm 2 hysteresis	1
Alarm 2 Smart Alarm	Disabled
Alarm 2 ON delay time	0

Alarm 3 setpoint	0
Alarm 3 type	PV 2 proc high
Alarm 3 hysteresis	1
Alarm 3 Smart Alarm	Disabled
Alarm 3 ON delay time	0

Vacuum:

<i>Parameter</i>	<i>Value</i>
Alarm 1 setpoint	2000
Alarm 1 type	PV 2 proc low
Alarm 1 hysteresis	1
Alarm 1 Smart Alarm	Disabled
Alarm 1 ON delay time	0
Alarm 2 setpoint	301
Alarm 2 type	PV 2 proc low
Alarm 2 hysteresis	1
Alarm 2 Smart Alarm	Disabled
Alarm 2 ON delay time	0
Alarm 3 setpoint	1400
Alarm 3 type	PV 2 proc high
Alarm 3 hysteresis	1
Alarm 3 Smart Alarm	Disabled
Alarm 3 ON delay time	0

IR + Probe:

<i>Parameter</i>	<i>Value</i>
Alarm 1 setpoint	10
Alarm 1 type	PV 1 band NC
Alarm 1 hysteresis	1
Alarm 1 Smart Alarm	Disabled
Alarm 1 ON delay time	0
Alarm 2 setpoint	15
Alarm 2 type	PV 2 band NC
Alarm 2 hysteresis	1
Alarm 2 Smart Alarm	Disabled
Alarm 2 ON delay time	0
Alarm 3 setpoint	1400
Alarm 3 type	PV 2 proc high
Alarm 3 hysteresis	1
Alarm 3 Smart Alarm	Disabled
Alarm 3 ON delay time	0

Nitrider:

<i>Parameter</i>	<i>Value</i>
Alarm 1 setpoint	10
Alarm 1 type	PV 1 dev NC
Alarm 1 hysteresis	1
Alarm 1 Smart Alarm	Disabled
Alarm 1 ON delay time	0
Alarm 2 setpoint	15
Alarm 2 type	PV 2 dev NC
Alarm 2 hysteresis	1
Alarm 2 Smart Alarm	Disabled
Alarm 2 ON delay time	0
Alarm 3 setpoint	1400
Alarm 3 type	PV 2 proc high
Alarm 3 hysteresis	1
Alarm 3 Smart Alarm	Disabled
Alarm 3 ON delay time	0

%C Dual Temp:

<i>Parameter</i>	<i>Value</i>
Alarm 1 setpoint	10
Alarm 1 type	PV 1 band NC
Alarm 1 hysteresis	1
Alarm 1 Smart Alarm	Disabled
Alarm 1 ON delay time	0
Alarm 2 setpoint	15
Alarm 2 type	PV 2 band NC
Alarm 2 hysteresis	1
Alarm 2 Smart Alarm	Disabled
Alarm 2 ON delay time	0
Alarm 3 setpoint	1400
Alarm 3 type	PV 2 proc high
Alarm 3 hysteresis	1
Alarm 3 Smart Alarm	Disabled
Alarm 3 ON delay time	0

Setpoint:

This value is the setpoint for the alarm. Clicking on this value will display an input box from which the user can select a new value. The range is from –9999.00 to 9999.00.

Alarm Type:

This value is the type of alarms used. Clicking on this value will display an input box with two (2) drop-down lists from which the user can select a new value.

The values in the first (top) list box are:

PV 1 Value

PV 2 Value
PV 3 Value
Input 1 Value
Input 2 Value
Input 3 Value
PO1 Value
PO2 Value
PO3 Value

The values in the second (bottom) list box are:

Process High
Process Low
Band, Normally Open
Band, Normally Closed
Deviation, Normally Open
Deviation, Normally Closed

Hysteresis:

This value is the Hysteresis value. Clicking on this value will display an input box from which the user can select a new value. The range is from **0** to **9999**.

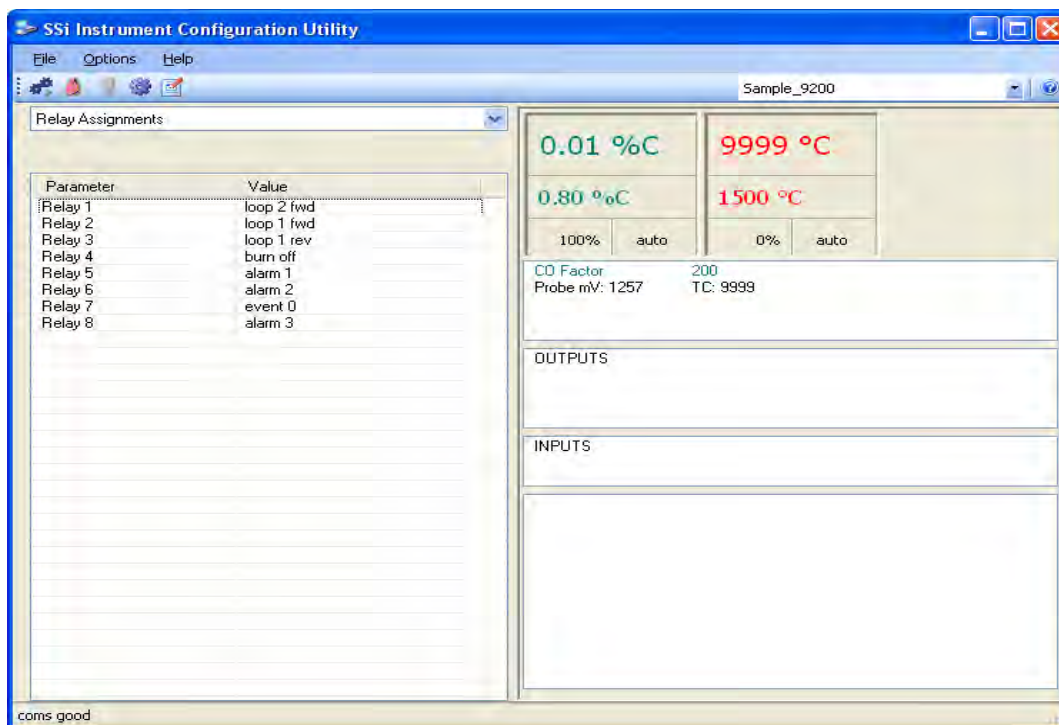
Smart Alarm:

This value is a display of the Smart Alarm status. The value can be either **disabled** or **enabled**.

ON Delay Time:

This value is the ON Delay Time. Clicking on this value will display an input box from which the user can select a new value. The range is from **0** to **9999**.

Relay Assignments



Configurator – Relay Assignments menu option

The 9200 Dual Loop controller has the option of using eight relay outputs. All of the relays have a positive common terminal and independent negative terminals. All of the relays are configured in a normally closed position except relay number eight, which has both a normally closed (NC) and a normally open (NO) terminal.

Relay Output Terminals:

- Relay Output 1 – terminals 7 and 8
- Relay Output 2 – terminals 7 and 9
- Relay Output 3 – terminals 7 and 10
- Relay Output 4 – terminals 7 and 11
- Relay Output 5 – terminals 7 and 12
- Relay Output 6 – terminals 7 and 13
- Relay Output 7 – terminals 7 and 14
- Relay Output 8 – terminals 7 and 15 NC
- Relay Output 8 – terminals 7 and 16 NO

Default Configuration:

Carbon:

Relay Output 1	Loop 2 - Forward
Relay Output 2	Loop 1 - Forward
Relay Output 3	Loop 1 - Reverse
Relay Output 4	Burn off
Relay Output 5	Alarm 1

Relay Output 6	Alarm 2
Relay Output 7	Alarm 0
Relay Output 8	Alarm 3

Dewpoint:

Relay Output 1	Loop 2 - Forward
Relay Output 2	Loop 1 - Forward
Relay Output 3	Loop 1 - Reverse
Relay Output 4	Burn off
Relay Output 5	Alarm 1
Relay Output 6	Alarm 2
Relay Output 7	Event 0
Relay Output 8	Alarm 3

% O₂:

Relay Output 1	Loop 2 - Forward
Relay Output 2	Loop 1 - Reverse
Relay Output 3	Event 0
Relay Output 4	Event 1
Relay Output 5	Event 2
Relay Output 6	Event 3
Relay Output 7	Alarm 1
Relay Output 8	Alarm 2

MV:

Relay Output 1	Loop 2 - Forward
Relay Output 2	Loop 1 - Forward
Relay Output 3	Loop 1 - Reverse
Relay Output 4	Burn off
Relay Output 5	Alarm 1
Relay Output 6	Alarm 2
Relay Output 7	Event 0
Relay Output 8	Alarm 3

Multi-loop:

Relay Output 1	Loop 1 - Forward
Relay Output 2	Loop 1 - Reverse
Relay Output 3	Loop 2 - Forward
Relay Output 4	Loop 2 - Reverse
Relay Output 5	Loop 3 - Forward
Relay Output 6	Loop 3 - Reverse
Relay Output 7	Alarm 1
Relay Output 8	Alarm 2

Vacuum:

Relay Output 1	Event 0
Relay Output 2	Event 1

Relay Output 3	Event 2
Relay Output 4	Event 3
Relay Output 5	Alarm 1
Relay Output 6	Alarm 2
Relay Output 7	Loop 1 – Forward
Relay Output 8	Loop 1 - Reverse

IR + Probe:

Relay Output 1	Loop 2 - Forward
Relay Output 2	Loop 1 - Forward
Relay Output 3	Loop 1 - Reverse
Relay Output 4	N/A
Relay Output 5	Alarm 1
Relay Output 6	Alarm 2
Relay Output 7	Gauge 4 – Relay SP A
Relay Output 8	Alarm 3

Nitrider:

Relay Output 1	Loop 2 - Forward
Relay Output 2	Loop 1 - Forward
Relay Output 3	Event 1
Relay Output 4	Event 2
Relay Output 5	Alarm 1
Relay Output 6	Event 5
Relay Output 7	Event 6
Relay Output 8	Alarm 2

% C / Dual Temperature:

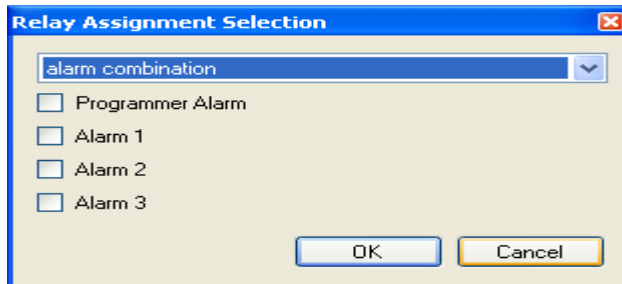
Relay Output 1	Loop 2 - Forward
Relay Output 2	Loop 1 - Forward
Relay Output 3	Loop 1 - Reverse
Relay Output 4	N/A
Relay Output 5	Alarm 1
Relay Output 6	Alarm 2
Relay Output 7	Event 0
Relay Output 8	Loop 3 Forward

Relay Output Choices:

Loop1 fwd	Event 3	burnoff
Loop1 rev	Event 4	IN1 relay SP A
Loop2 fwd	Event 5	IN1 relay SP B
Loop2 rev	Event 6	IN1 relay SP C
Loop3 fwd	Event 7	IN2 relay SP A
Loop3 rev	Event 8	IN2 relay SP B
Programmer alarm	Event 9	IN2 relay SP C
Alarm 1	Event 10	IN3 relay SP A
Alarm 2	Event 11	IN3 relay SP B

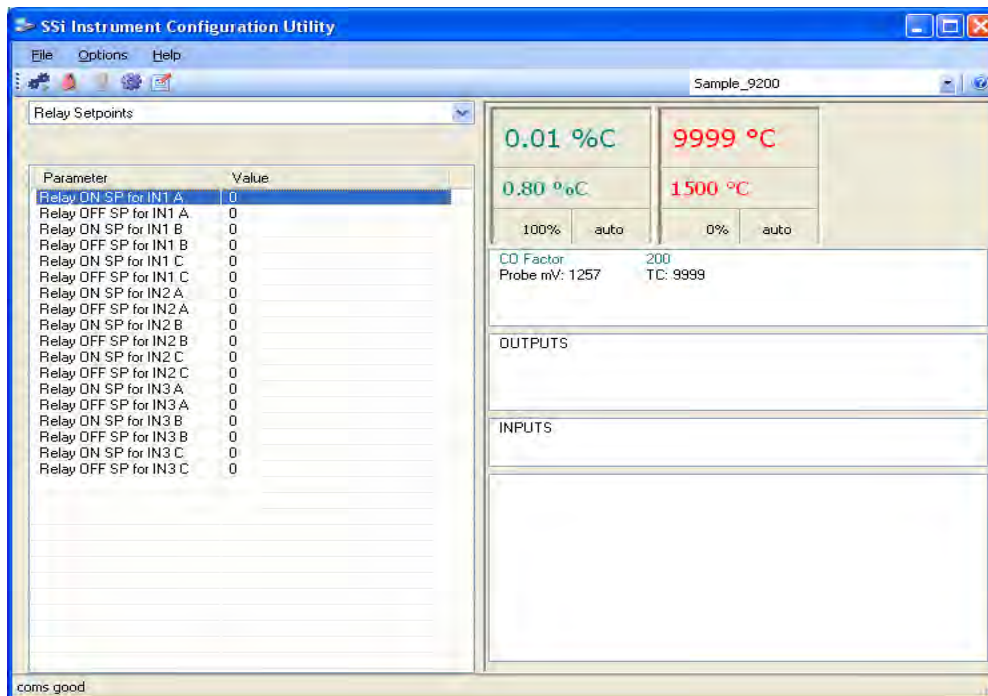
Alarm 3	Event 12	IN3 relay SPC
Event 0	Event 13	alarm combination
Event 1	Event 14	
Event 2	Event 15	

The "Alarm Combination" option will allow the user to select the specific combination of alarms to use.



Configurator – Alarm Combination options

Relay Setpoints



Configurator – Relay Setpoints menu option

This option is typically used for vacuum applications.

The 9200 dual Loop controller offers the user three pairs of configurable vacuum setpoints for each input. Each pair of setpoints allows the user to configure both **ON** and **OFF** trigger points. The values entered are in engineering units based on input configuration.

The relay setpoints can only be used once the relays are assigned as such in the *Relay Assignments* menu option.

The range is **–32768** to **32767**.

Analog Input Setup

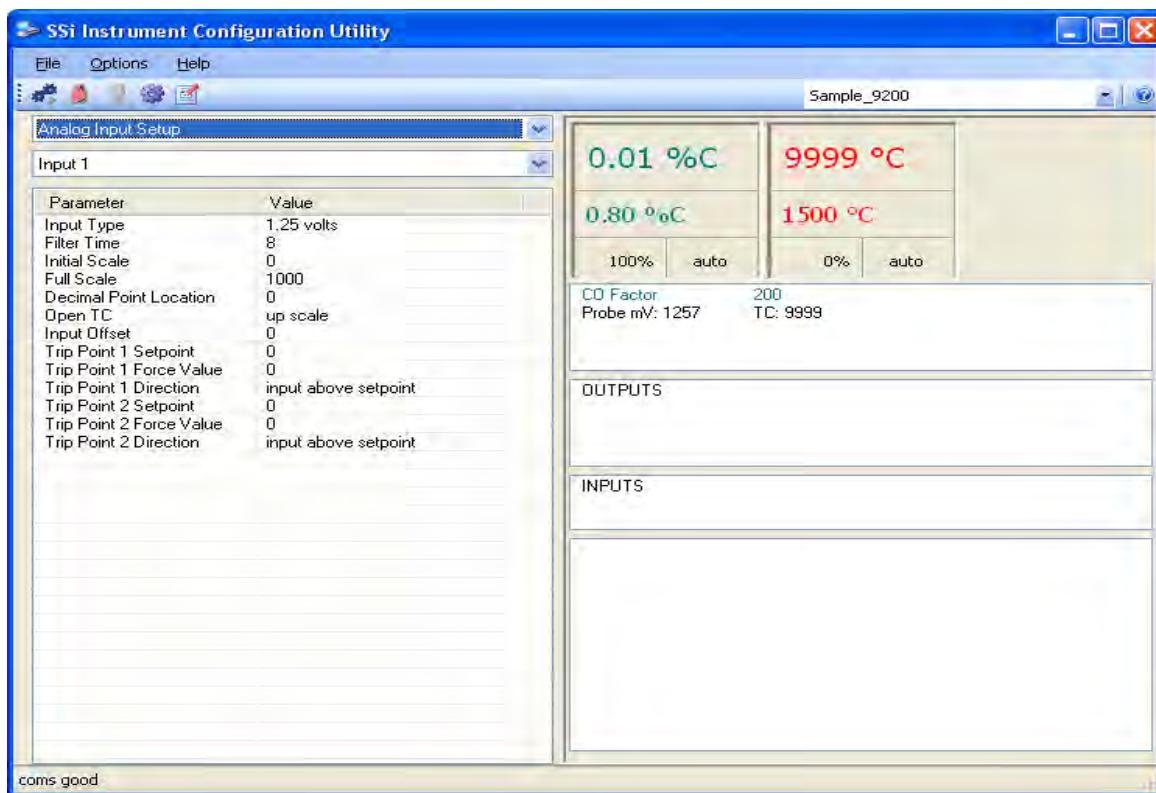
The 9200 dual loop controller has three analog inputs. Each of the inputs comes with a factory default configuration dependent on the application. It can be modified prior to shipment to your facility or in the field by a technician or qualified/trained person with the proper security code.

Analog Input Terminals

Analog Input 1 – terminals 31 and 32

Analog Input 2 – terminals 29 and 30

Analog Input 3 – terminals 27 and 28



Configurator - Analog Input Setup menu option

Factory Default configurations:

Carbon:

	INPUT 1	INPUT 2	INPUT 3
Input Type	1.25 volts	S	K
Filter Time	8	8	8

Initial Scale	0	0	0
Full Scale	1000	10000	10000
Decimal Point Location	0	0	0
Open T/C	Up Scale	Up Scale	Up Scale
Input Offset	0	0	0
Trip Point 1 Setpoint	0	0	0
Trip Point 1 Force Value	0	0	0
Trip Point 1 Direction	Input above setpoint	Input above setpoint	Input above setpoint
Trip Point 2 Setpoint	0	0	0
Trip Point 2 Force Value	0	0	0
Trip Point 2 Direction	Input above setpoint	Input above setpoint	Input above setpoint

Dew Point:

	INPUT 1	INPUT 2	INPUT 3
Input Type	2.5 volts	S	K
Filter Time	8	8	8
Initial Scale	0	0	0
Full Scale	1000	10000	10000
Decimal Point Location	0	0	0
Open T/C	Up Scale	Up Scale	Up Scale
Input Offset	0	0	0
Trip Point 1 Setpoint	0	0	0
Trip Point 1 Force Value	0	0	0
Trip Point 1 Direction	Input above setpoint	Input above setpoint	Input above setpoint
Trip Point 2 Setpoint	0	0	0
Trip Point 2 Force Value	0	0	0
Trip Point 2 Direction	Input above setpoint	Input above setpoint	Input above setpoint

% O₂ (Oxygen):

	INPUT 1	INPUT 2	INPUT 3
Input Type	1.25 volts	B	K
Filter Time	8	8	8
Initial Scale	0	0	0
Full Scale	1000	10000	10000
Decimal Point Location	0	0	0
Open T/C	Up Scale	Up Scale	Up Scale
Input Offset	0	0	0
Trip Point 1 Setpoint	0	0	0
Trip Point 1 Force Value	0	0	0
Trip Point 1 Direction	Input above setpoint	Input above setpoint	Input above setpoint
Trip Point 2 Setpoint	0	0	0
Trip Point 2 Force	0	0	0

Value			
Trip Point 2 Direction	Input above setpoint	Input above setpoint	Input above setpoint

mV (Millivolts):

	INPUT 1	INPUT 2	INPUT 3
Input Type	2.5 volts	S	K
Filter Time	8	8	8
Initial Scale	0	0	0
Full Scale	1000	10000	10000
Decimal Point Location	0	0	0
Open T/C	Up Scale	Up Scale	Up Scale
Input Offset	0	0	0
Trip Point 1 Setpoint	0	0	0
Trip Point 1 Force Value	0	0	0
Trip Point 1 Direction	Input above setpoint	Input above setpoint	Input above setpoint
Trip Point 2 Setpoint	0	0	0
Trip Point 2 Force Value	0	0	0
Trip Point 2 Direction	Input above setpoint	Input above setpoint	Input above setpoint

Multiloop:

	INPUT 1	INPUT 2	INPUT 3
Input Type	K	K	K
Filter Time	8	8	8
Initial Scale	0	0	0
Full Scale	1000	10000	10000
Decimal Point Location	0	0	0
Open T/C	Up Scale	Up Scale	Up Scale
Input Offset	0	0	0
Trip Point 1 Setpoint	0	0	0
Trip Point 1 Force Value	0	0	0
Trip Point 1 Direction	Input above setpoint	Input above setpoint	Input above setpoint
Trip Point 2 Setpoint	0	0	0
Trip Point 2 Force Value	0	0	0
Trip Point 2 Direction	Input above setpoint	Input above setpoint	Input above setpoint

Vacuum:

	INPUT 1	INPUT 2	INPUT 3
Input Type	K	K	K
Filter Time	8	8	8
Initial Scale	0	0	0
Full Scale	1000	10000	10000
Decimal Point Location	0	0	0
Open T/C	Up Scale	Up Scale	Up Scale

Input Offset	0	0	0
Trip Point 1 Setpoint	0	0	0
Trip Point 1 Force Value	0	0	0
Trip Point 1 Direction	Input above setpoint	Input above setpoint	Input above setpoint
Trip Point 2 Setpoint	0	0	0
Trip Point 2 Force Value	0	0	0
Trip Point 2 Direction	Input above setpoint	Input above setpoint	Input above setpoint

IR + Probe:

	INPUT 1	INPUT 2	INPUT 3
Input Type	2.5 volts	S	K
Filter Time	8	8	8
Initial Scale	0	0	0
Full Scale	1000	10000	10000
Decimal Point Location	0	0	0
Open T/C	Up Scale	Up Scale	Up Scale
Input Offset	0	0	0
Trip Point 1 Setpoint	0	0	0
Trip Point 1 Force Value	0	0	0
Trip Point 1 Direction	Input above setpoint	Input above setpoint	Input above setpoint
Trip Point 2 Setpoint	0	0	0
Trip Point 2 Force Value	0	0	0
Trip Point 2 Direction	Input above setpoint	Input above setpoint	Input above setpoint

Nitrider:

	INPUT 1	INPUT 2	INPUT 3
Input Type	1.25 volts	4 – 20 mA	K
Filter Time	8	8	8
Initial Scale	0	0	0
Full Scale	1000	500	10000
Decimal Point Location	0	3	0
Open T/C	Up Scale	Up Scale	Up Scale
Input Offset	0	0	0
Trip Point 1 Direction	Input above setpoint	Input above setpoint	Input above setpoint
Trip Point 2 Setpoint	0	0	0
Trip Point 2 Force Value	0	0	0
Trip Point 2 Direction	Input above setpoint	Input above setpoint	Input above setpoint

% C Dual Temp:

	INPUT 1	INPUT 2	INPUT 3
Input Type	2.5 volts	K	K
Filter Time	8	8	8

Initial Scale	0	0	0
Full Scale	1000	10000	10000
Decimal Point Location	0	0	0
Open T/C	Up Scale	Up Scale	Up Scale
Input Offset	0	0	0
Trip Point 1 Direction	Input above setpoint	Input above setpoint	Input above setpoint
Trip Point 2 Setpoint	0	0	0
Trip Point 2 Force Value	0	0	0
Trip Point 2 Direction	Input above setpoint	Input above setpoint	Input above setpoint

Parameter Definitions:

Input Type:

The thermocouple type for most applications can be modified depending on your specific needs. Please note that in some applications, some of the inputs DO NOT allow the user to modify the Input type. To change the Input type, first select which input you want to change by selecting it in the pull-down menu just below the main menu list. Clicking on the Value will display an input box, and then you can use the pull-down menu to select the desired parameter. Once selected, click *OK* and the displayed Input type under Value will be the current type. The following is a list of the options:

B	S	12.5 volts
C	T	781.25mv
E	2.5 volts	195.3125 mV
J	1.25 volts	
K	78.125 mV	
N	19.53125 mV	
NNM	4-20 mA	
R	25 volts	

Filter time:

The filter time is a factory applied averaging tool used to help maintain steady control in high EMI environments. The filter time should not be adjusted with consulting SSI. Clicking on this value will display an input box from which the user can select a new value. The range is **0** to **32767**.

Initial Scale:

This is the initial scale value. Clicking on this value will display an input box from which the user can select a new value. The range is **-32768** to **32767**.

Full scale:

This is the full scale value. Clicking on this value will display an input box from which the user can select a new value. The range is **-32768** to **32767**.

Decimal Point Location:

This is the decimal point location value. Clicking on this value will display an input box from which the user can select a new value. The range is **0** to **4**.

Open TC:

This is the open TC value. Clicking on this value will toggle between **up scale**, **down scale**, **one trip point**, and **two trip points**.

Input Offset:

The input offset value is algebraically added to the input value to adjust the input curve on read-out. The range is -10 to 10.

Trip Point 1 Setpoint:

This is the trip point 1 setpoint value. The range is **-32768** to **32768**.

Trip Point 1 Force Value:

This is the trip point 1 force value. The range is **-32768** to **32768**.

Trip Point 1 Direction:

This is the trip point 1 direction. The options are: **input above setpoint** or **input below setpoint**.

Trip Point 2 Setpoint:

This is the trip point 2 setpoint value. The range is **-32768** to **32768**.

Trip Point 2 Force Value:

This is the trip point 2 force value. The range is **-32768** to **32768**.

Trip Point 2 Direction:

This is the trip point 2 direction. The options are: **input above setpoint** or **input below setpoint**.

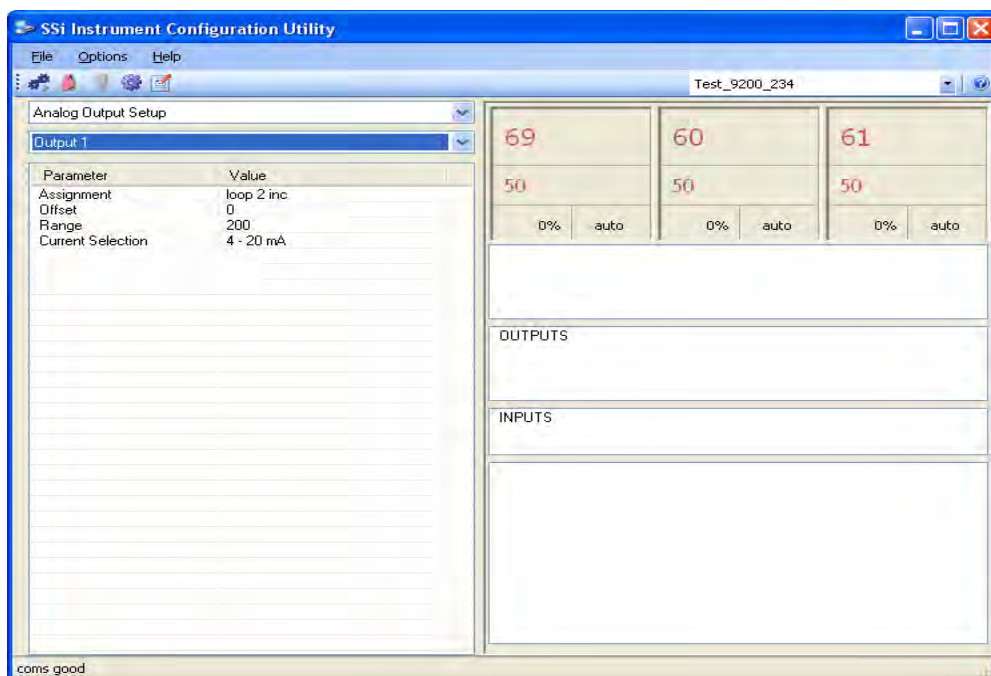
Analog Output setup

The 9200 Dual Loop controller has the option of two analog outputs. The outputs are ranged for a 4 – 20 milliamp signal or a 0 – 20 milliamp signal. Each output comes with a factory default configuration dependent on the application. Each output can be modified prior to shipment to your facility or in the field by a supervisor.

Analog Output Terminals:

Analog output 1 – terminals 24 and 25

Analog output 2 – terminals 25 and 26



Configurator - Analog Output Setup menu option

Factory Default Configurations:

Carbon:

	<u>Output 1</u>	<u>Output 2</u>
Assignment	loop 1 inc	PV 1 retrans
Offset	0	0
Range	200	200
Current Selection	4 – 20 mA	4 – 20 mA

Dewpoint:

	<u>Output 1</u>	<u>Output 2</u>
Assignment	loop 2 inc	PV 1 retrans
Offset	0	-50
Range	200	80
Current Selection	4 – 20 mA	4 – 20 mA

%O2:

	<u>Output 1</u>	<u>Output 2</u>
Assignment	loop 1 inc	PV 1 retrans
Offset	0	0
Range	200	3000
Current Selection	4 – 20 mA	4 – 20 mA

MV:

	<u>Output 1</u>	<u>Output 2</u>
Assignment	loop 2 inc	PV 1 retrans
Offset	0	0

Range	2000	20000
Current Selection	4 – 20 mA	4 – 20 mA

Multiloop:

	<u>Output 1</u>	<u>Output 2</u>
Assignment	loop 1 inc	PV 1 retrans
Offset	0	0
Range	200	3000
Current Selection	4 – 20 mA	4 – 20 mA

Vacuum:

	<u>Output 1</u>	<u>Output 2</u>
Assignment	loop 1 inc	PV 1 retrans
Offset	0	0
Range	200	3000
Current Selection	4 – 20 mA	4 – 20 mA

IR + Probe:

	<u>Output 1</u>	<u>Output 2</u>
Assignment	loop 2 inc	PV 1 retrans
Offset	0	0
Range	200	200
Current Selection	4 – 20 mA	4 – 20 mA

Nitrider:

	<u>Output 1</u>	<u>Output 2</u>
Assignment	loop 1 inc	PV 1 retrans
Offset	0	0
Range	200	3000
Current Selection	4 – 20 mA	4 – 20 mA

%C Dual Temp:

	<u>Output 1</u>	<u>Output 2</u>
Assignment	loop 2 inc	PV 1 retrans
Offset	0	0
Range	200	200
Current Selection	4 – 20 mA	4 – 20 mA

Assignment:

The analog output assignment can be modified depending on your system requirements. To change the Assignment first select which analog output you want to change by selecting it in the pull-down menu just below the main menu list. Clicking on this value will display an input box, and then you can use the pull-down menu to select the desired parameter. Once selected click **OK** and the displayed assignment under Value will be the current assignment type. The following is a list of the options:

PV 1 retrans	PV3 retrans
Loop 1 inc	Loop 3 inc
Loop 1 dec	Loop 3 dec
Loop 1 combo	Loop 3 combo
PV 2 retrans	Input 1 retrans
Loop 2 inc	Input 2 retrans
Loop 2 dec	Input 3 retrans
Loop 2 combo	Input 4 retrans

Combo example for carbon – 4 – 12 mA Air
12 – 20 mA Gas

Offset:

This is the starting point, the Process Variable value at which you get 4 milliamps. Clicking on this value will display an input box from which the user can select a new value. The range is – **32768** to **32767**.

Range:

This is a Process Variable value between 4 and 20 milliamps. Clicking on this value will display an input box from which the user can select a new value. The range is –**32768** to **32767**.

Current Selection:

Provides the option of **4-20 mA** or **0-20 mA** control. Clicking on this value will display an input box with a drop-down list from which the user can select either of the two values listed above.

Offset and Range when assigned to a control loop:

Inc -- 0 = 4mA, 100 = 20mA

Dec -- 0 = 4mA, -100 = 20mA

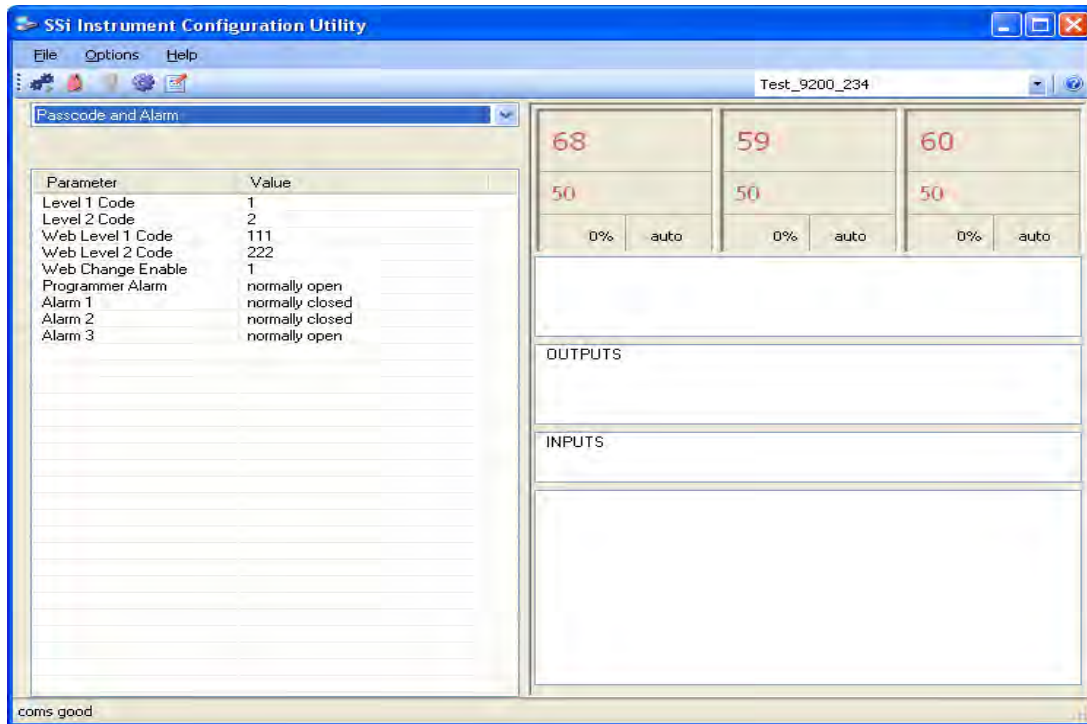
Example: if 4 – 20 mA = 800 mV - 1200 mV

Offset = 800 (starting point)

Range = 400


Passcode and Alarm

There are four levels of menus in the 9200 Dual loop controller - Operator, Supervisor, Administrator, and SSi Special.




Configurator – Passcodes and Alarms menu option


Operator Level:

These are functions typically handled by a furnace operator and do not require a passcode. When an operator is logged in, the lock on the toolbar will be blue, .


Supervisor Level:

These are functions typically used by a supervisor and require a level 1 passcode. When a supervisor is logged in, the lock on the toolbar will be gold, . To change the level 1 passcode, or the web level 1 passcode, click on the "Level 1 Code" value (range is **–32768** to **32767**) or the "Web Level 1 Code" value (range is **0** to **9999**) and an input box will be displayed where the user can select a new value.

Administrator:

These are functions typically used by an administrator and require a level 2 passcode. When an administrator is logged in, the lock on the toolbar will be green, . To change the level 2 passcode or the web level 2 passcode, click on the "Level 2 Code" value (range is **–32768** to **32767**) or the "Web Level 2 Code" value (range is **0** to **9999**) and an input box will be displayed where the user can select a new value.

SSi Special:

These are functions that cannot be accessed without a passcode provided by Super System Inc. These functions are vital to the operating modes of the controller and are typically never modified. When an SSI Special user is logged in, the lock on the toolbar will be red, .

Web Change Enable:

Clicking on this value will toggle between a **1** and a **0**.

Programmer Alarm:

Also available in this menu option is the availability to change the status of the relay contact with relation to alarms. As shipped, the relay contact is open with no alarm. The user can choose either **normally open** or **normally closed**.

Alarm 1:

The user can choose either **normally open** or **normally closed**.

Alarm 2:


The user can choose either **normally open** or **normally closed**.

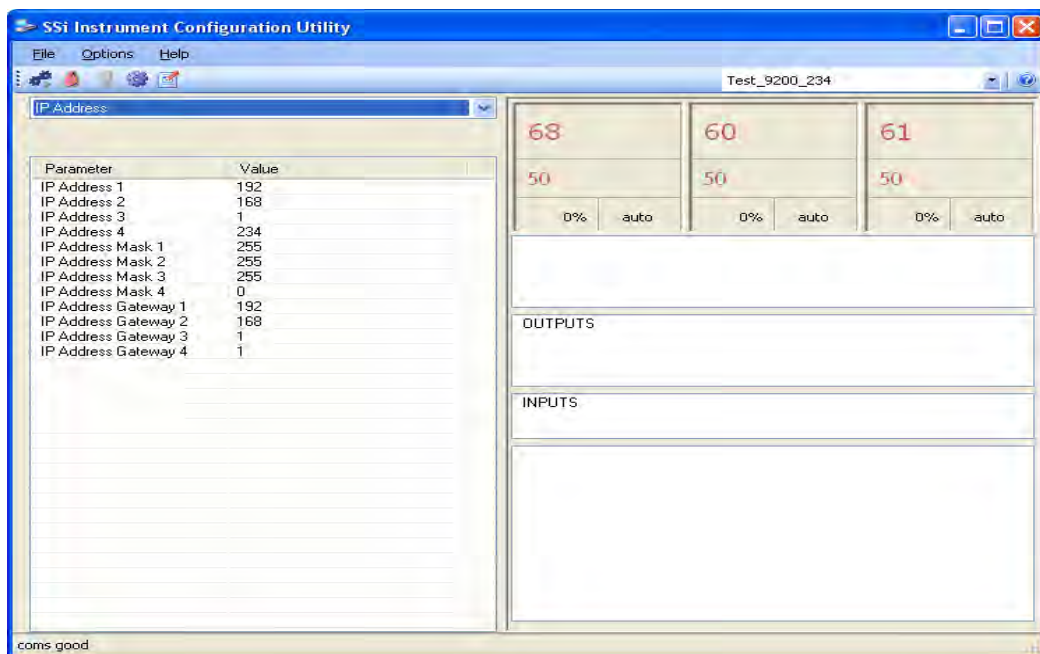
Alarm 3:

The user can choose either **normally open** or **normally closed**.

IP Address

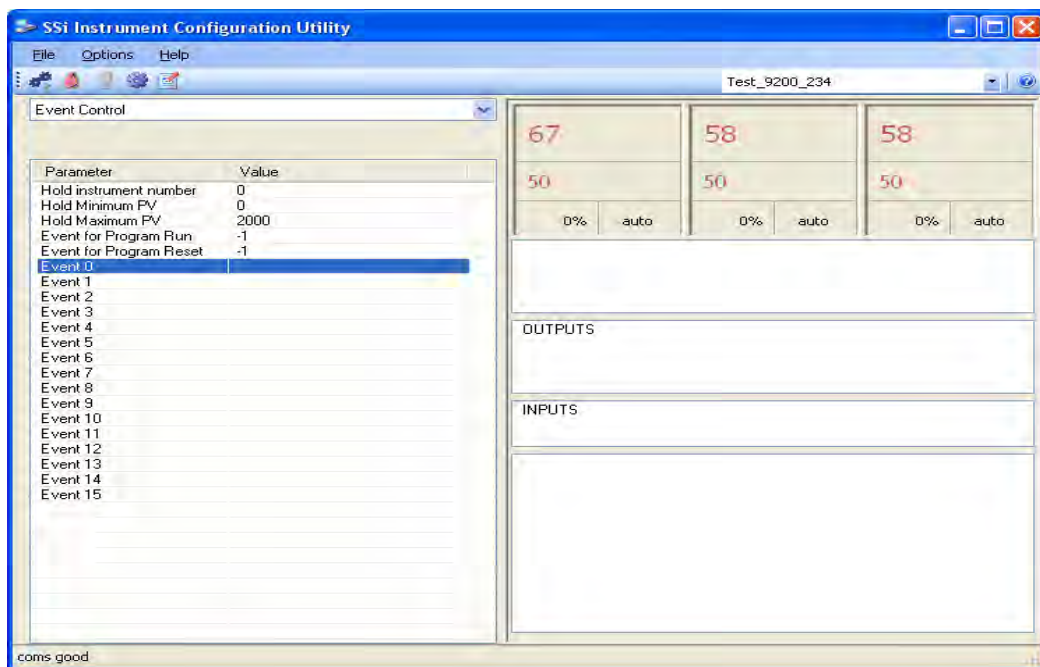
The IP Address menu item is a display of the current IP Address, IP Address Mask, and the IP Address Gateway of the controller. Modification of the screen should not be done without contacting Super Systems Inc. This page allows the user to change the IP Address, IP Address Mask, and IP Address Gateway. Clicking on any of the values will bring up an input box that will allow the user to edit the values. The range is **0** to **255**. *Note – If the IP address of the controller is changed, then the IP address will have to be changed in the System Settings menu*

option (). Once the IP address has been changed, the communications will eventually be bad.



Configurator - IP Address menu option

Event Control



Configurator - Event Control menu option

The Event control provides the user manual control of actual event outputs. This is useful when testing wiring and field devices.

Hold Instrument Number:

Clicking on this value will display an input box from which the user can select a new value. The range is **0** to **25**.

Hold Minimum PV:

Clicking on this value will display an input box from which the user can select a new value. The range is **0** to **4000**.

Hold Maximum PV:

Clicking on this value will display an input box from which the user can select a new value. The range is **0** to **4000**.

Event for Program Run:

Clicking on this value will display an input box from which the user can select a new value. The range is **-1** to **15**.

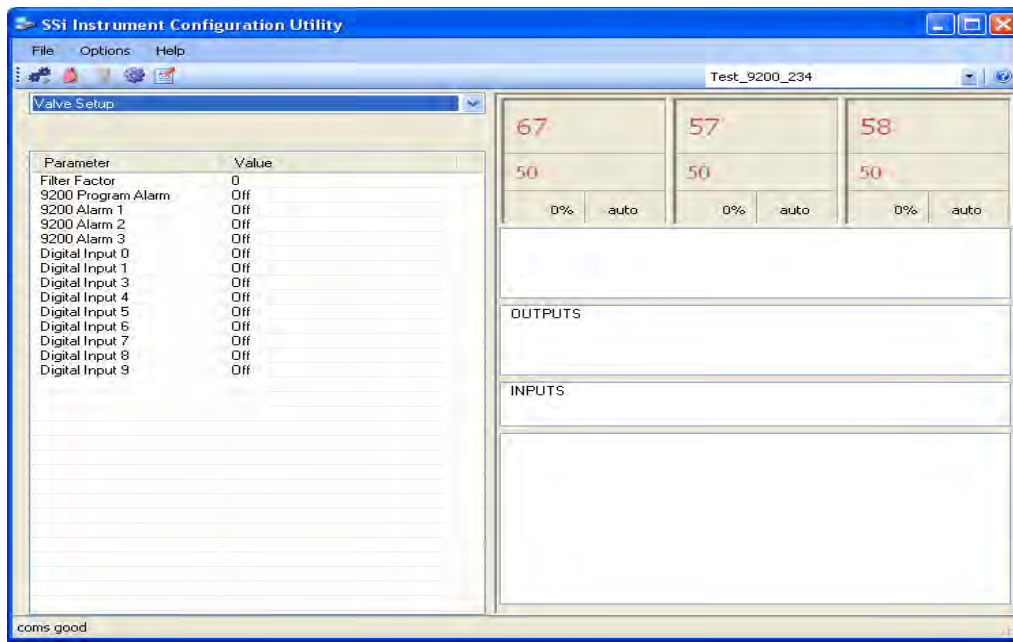
Event for Program Reset:

Clicking on this value will display an input box from which the user can select a new value. The range is **-1** to **15**.

Event 0 Through Event 15:

The input box for these events has two drop-down lists. The top list contains **active** and **inactive**, and the bottom list contains **closed** and **open**.

Valve Setup



Configurator – Valve Setup menu option

Filter Factor:

Clicking on this value will display an input box where the user can select the Filter Factor. The range is **0** to **1648**.

9200 Program Alarm:

The input box for this value has two drop-down lists. The top list contains **critical disabled** and **critical enabled**. The bottom drop-down list contains **non-critical disabled** and **non-critical enabled**.

9200 Alarm 1:

The input box for this value has two drop-down lists. The top list contains **critical disabled** and **critical enabled**. The bottom drop-down list contains **non-critical disabled** and **non-critical enabled**.

9200 Alarm 2:

The input box for this value has two drop-down lists. The top list contains **critical disabled** and **critical enabled**. The bottom drop-down list contains **non-critical disabled** and **non-critical enabled**.

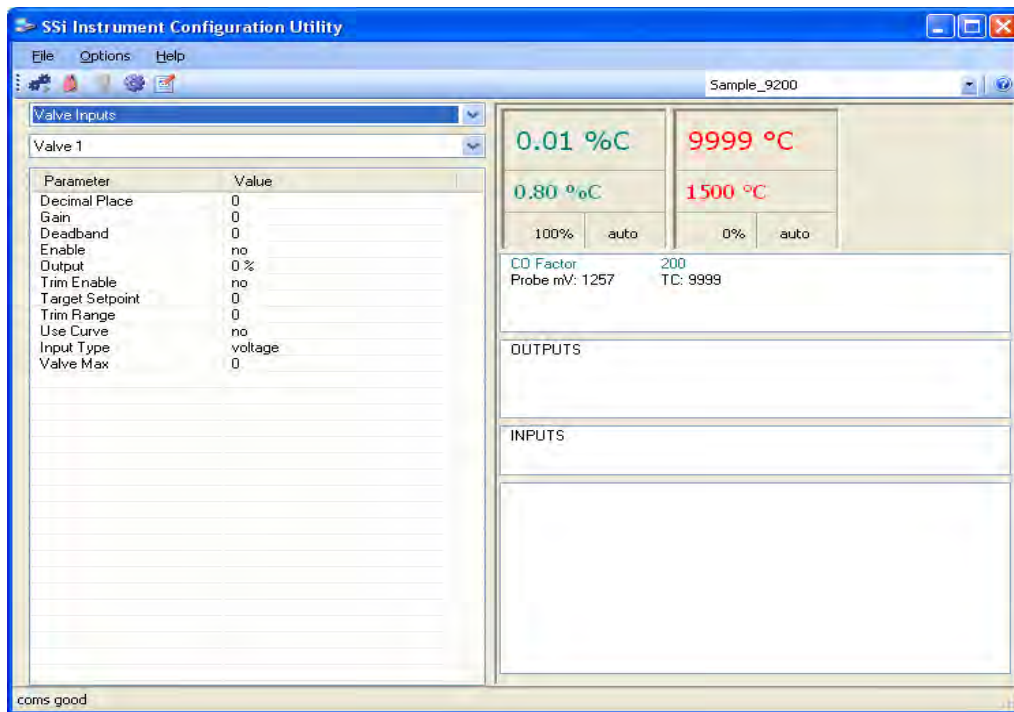
9200 Alarm 3:

The input box for this value has two drop-down lists. The top list contains **critical disabled** and **critical enabled**. The bottom drop-down list contains **non-critical disabled** and **non-critical enabled**.

Digital Input 0 - 9:

The input box for these values have two drop-down lists. The top list contains **critical disabled** and **critical enabled**. The bottom drop-down list contains **non-critical disabled** and **non-critical enabled**.

Valve Inputs



Configurator - Valve Inputs menu option

This option is used only for Nitriding applications.

Valve 1 – Nitrogen

Valve 2 – Ammonia

Valve 3 – Dissociated Ammonia (D.A.)

Valve 4 – spare

Decimal place:

The number of places shown after the decimal point. Clicking on this value displays an input box from which the user can change the decimal place. The range is **0** to **4**.

Gain:

The amount of response (speed) of the valve. Clicking on this value displays an input box from which the user can change the gain. The range is **0** to **200**.

Deadband:

This is measured in units of flow (scfh). Clicking on this value displays an input box from which the user can change the deadband. The range is **0** to **32000**.

Enable:

Enable allows the user to manually turn the valve on or off. The options are **Yes** or **No**.

Output:

This is the measured output shown as a percentage, and it cannot be modified.

Trim Enable:

Trim Enable allows the user to manually turn the trim on or off. The options are **Yes** or **No**.

Target Setpoint:

This is measured in units of flow (scfh). Clicking on the value will display an input box from which the user can select a new setpoint. The range is **0** to **4000**.

Trim Range:

The allowable specified range of control with the trim enabled - typically set in the program. Clicking on this value will display an input box from which the user can select a new Trim Range. The range is **0** to **10000**.

Use Curve:

This option manually turns on or off the custom curve entered in the *Curve Entry* menu option. The options are **Yes** or **No**.

Input Type:

Clicking on this value will display a drop down menu with the following choices:

voltage

mA / 124 ohm

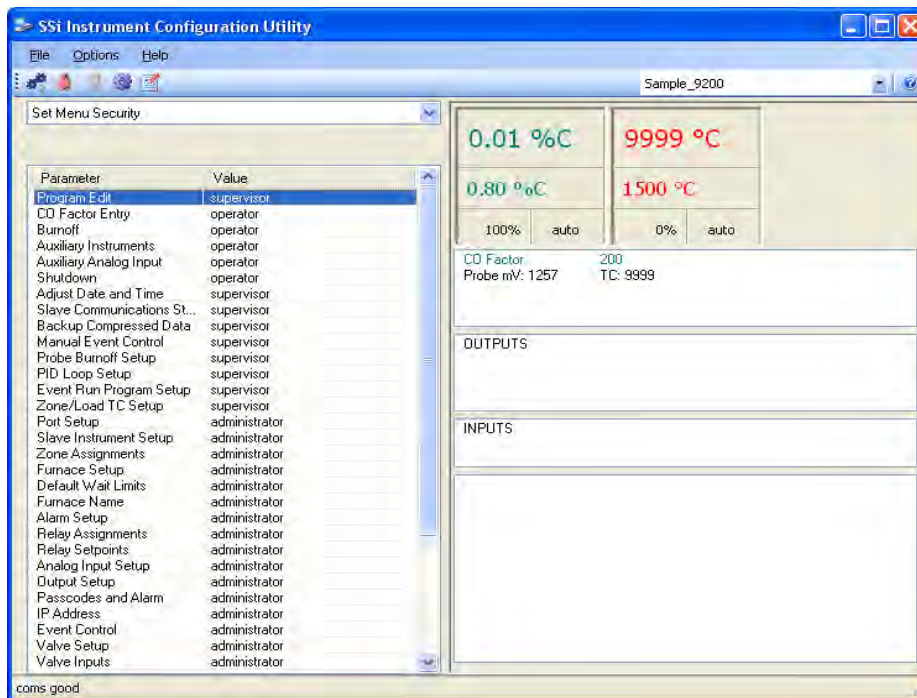
mA / 249 ohm

mA / 499 ohm

Valve Max:

This is the maximum valve range in units. Clicking on this value displays an input box from which the user can select a new maximum value. The range is **100** to **30000**.

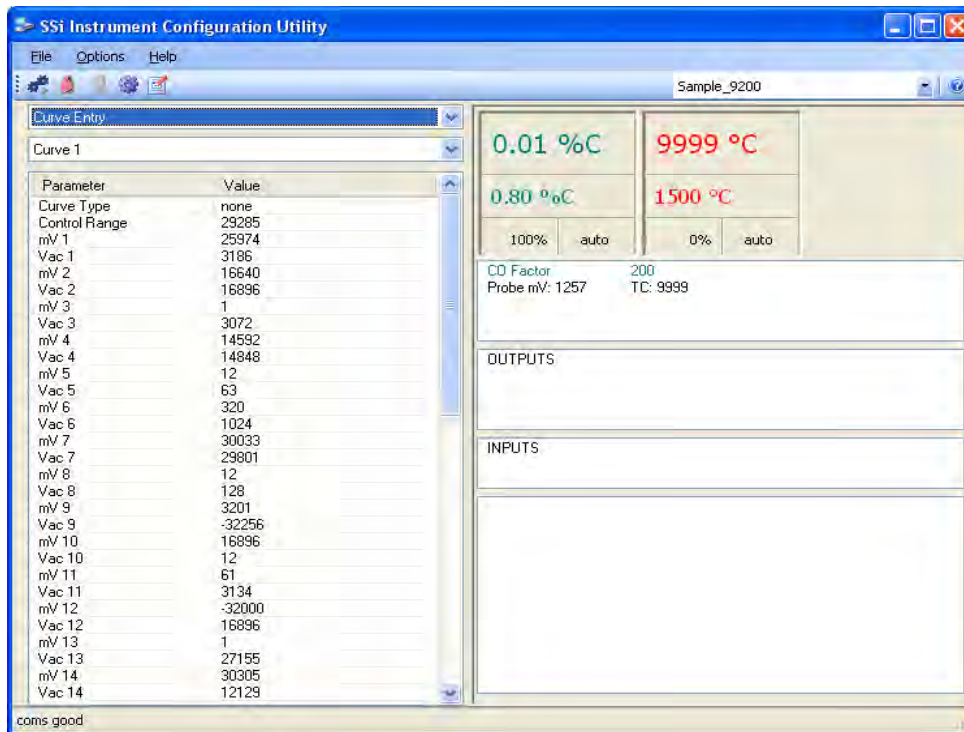
Set Menu Security



Configurator - Set Menu Security menu option

The Set Menu Security menu option is a feature that is used to limit access to certain menu options and parameters that are vital to successful operation and communication of your instrument. This page comes pre-configured by Super Systems Inc. and should not be adjusted without consulting SSI. The options are **operator**, **supervisor**, or **administrator**.

Curve Entry



Configurator – Curve Entry menu option

Curve Entry is typically used for Vacuum and Nitriding applications. It allows the user to enter custom flow curves and vacuum gauge curves for Curve 1 through Curve 5.

Curve Type:

This is the type of curve. The options are **none** or **linear**.

Control Range:

This is the control range for the curve. The range is **0** to **32000**.

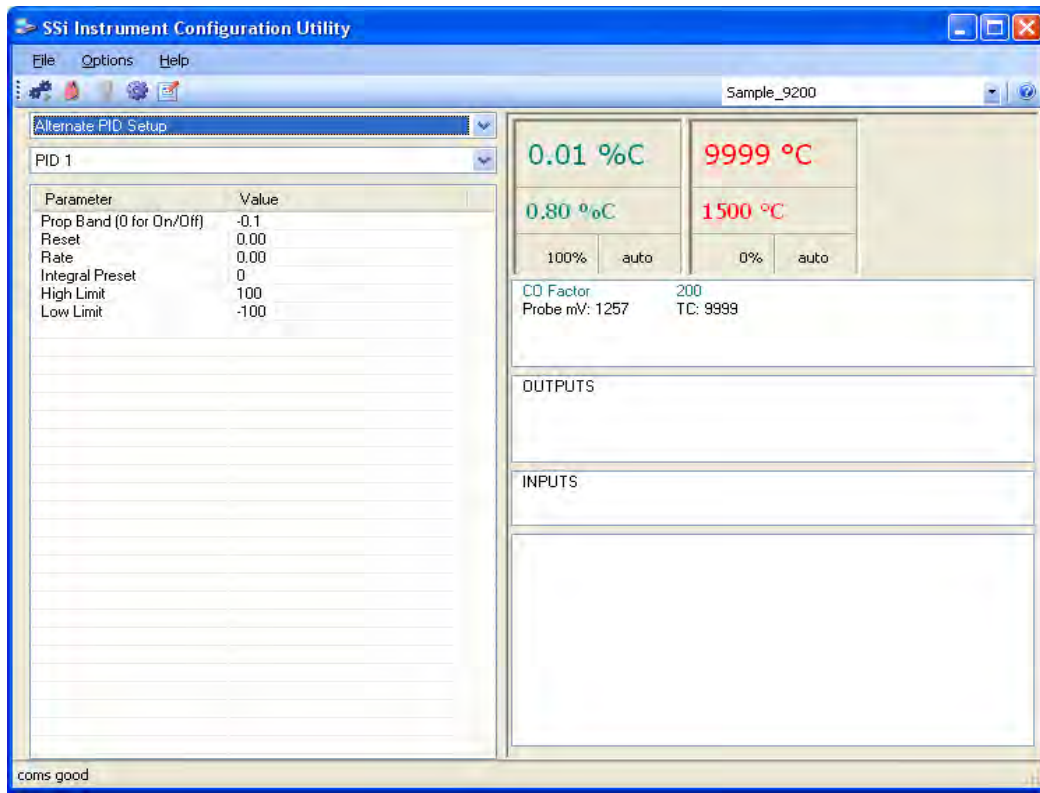
mVX(1 – 32):

Clicking on this value will display an input box from which the user can select a new millivolt value. The range is from **0** to **32000**.

VacX(1 – 32):

Clicking on this value will display an input box from which the user can select a new vacuum value. The range is from **0** to **32000**.

Alternate PID Setup



Configurator – Alternate PID Setup menu option

The Alternate PID Setup menu option allows for up to 16 sets of PID values to be used on all three loops via the programmer.

This menu option is typically used for vacuum applications with the programmer.

There is a choice of PID 1 – 16, and LP1 Set 1 – LP3 Set 3.

Prop Band (0 for On/Off):

This is the proportional band for the PID setup. The range of values is **–1.0** to **999.0**.

Reset:

This is the reset value. The range is **0.00** through **10.00**.

Rate:

This is the rate value. The range is **0.00** through **10.00**.

Integral Preset:

This is the integral preset value. The range is **–100** to **100**.

High Limit:

This is the high limit value. The range is **–100** to **100**.

Low Limit:

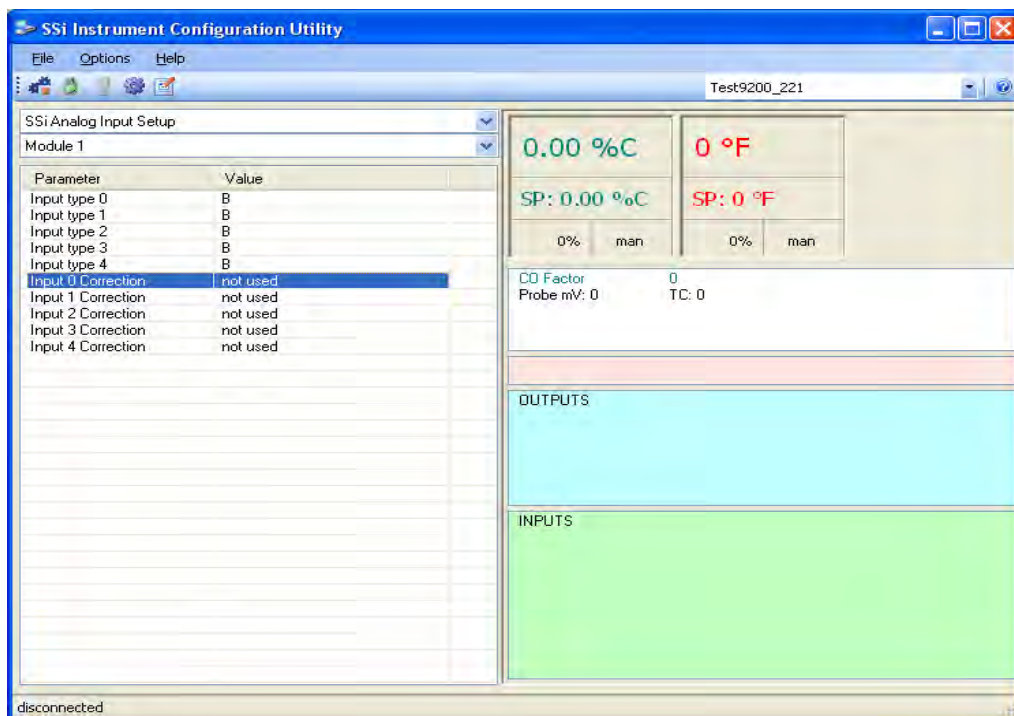
This is the low limit value. The range is **–100** to **100**.

SSI Analog Input Setup

The SSI Analog Input Setup menu option allows the user an input selection of five inputs per module, as well as five input corrections per module. There are eight modules available. It is configurable for voltage of T/C (universal input), and it is typically used for Load T/Cs and Auxiliary Flow Meters. Clicking on any of the values will display an input box from which the user can select the input type from a drop-down list with the following values:

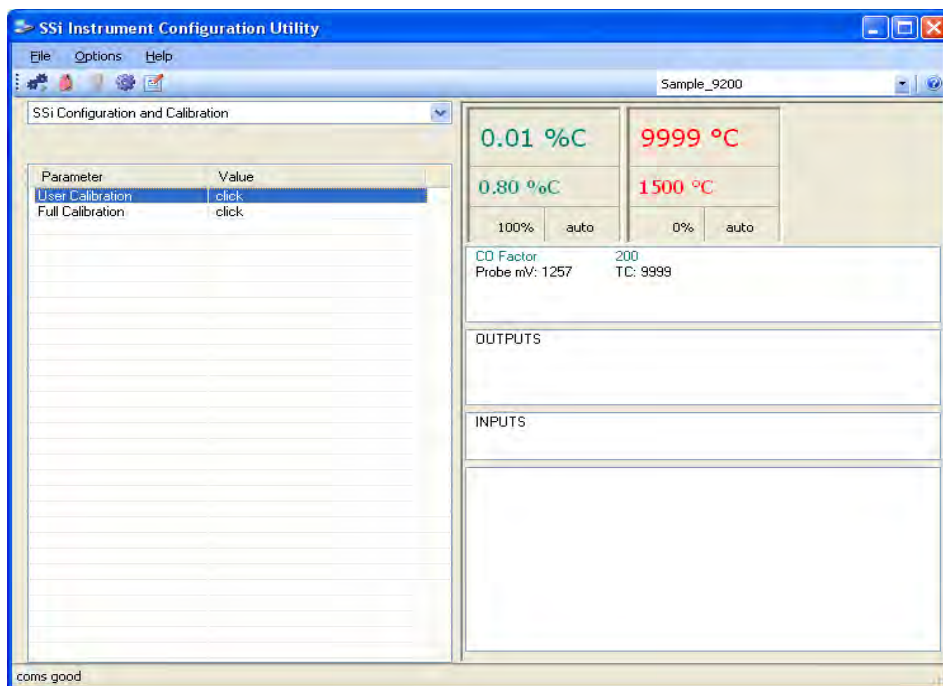
B	NNM	160 mV
C	R	80 mV
E	S	40 mV
J	T	20 mV
K	2.5 volts	4-20 mA
N	1.25 volts	

The corrections can either be **not used**, or **Curve 1 – Curve 3**. The curves are set up using the *TC Extension Correction Curves* menu option.



Configurator - SSI Analog Input Setup menu option

SSi Configuration and Calibration



Configurator – SSI Configuration and Calibration menu option

Overview

The series 9200 can be calibrated using the operator interface Configurator software usually supplied with the system. Before performing this procedure on a newly installed controller, the unit needs to be powered on for at least 30 minutes for a warm up period.

The series 9200 has three analog inputs. Each range has a zero and span calibration value. A cold junction trim value must be calibrated for thermocouple inputs. There are two analog outputs each with a zero and span value. When using the User Calibration procedure this will allow for the user to only calibrate the input ranges being used in the controller for which ever specific PVT is selected under furnace setup. The Full Calibration will calibrate all of the input ranges regardless of what is selected for PVT.

Equipment needed

A certified calibrator(s) with the ability to input and read millivolts, milliamps and thermocouples is required. The appropriate connection leads are also required. A 24VDC 75-watt power supply is required. The operator interface method requires a PC with the Configurator software loaded. An Ethernet crossover cable is required.

Notes

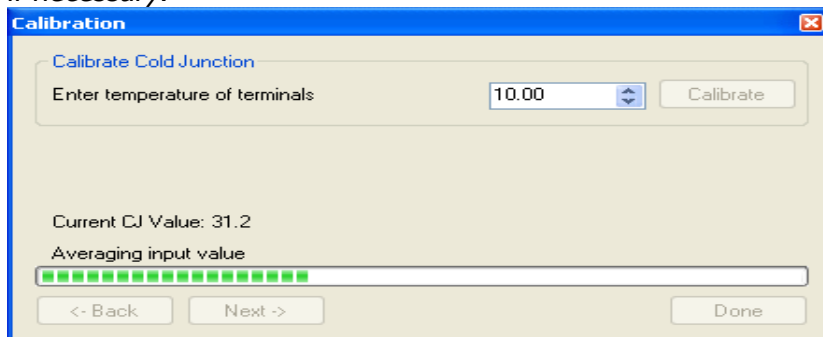
Input 1 – terminals 31 and 32
Input 2 – terminals 29 and 30
Input 3 – terminals 27 and 28
Output 1 – terminals 24 and 25
Output 2 – terminals 25 and 26

User Calibration

For complete calibration of Analog Inputs start with step #2 Zero and Span Calibration. Click on the "click" value next to the "User Calibration" field to start the user calibration. The *Calibration* screen will be displayed.

Step 1. Cold Junction Calibration.

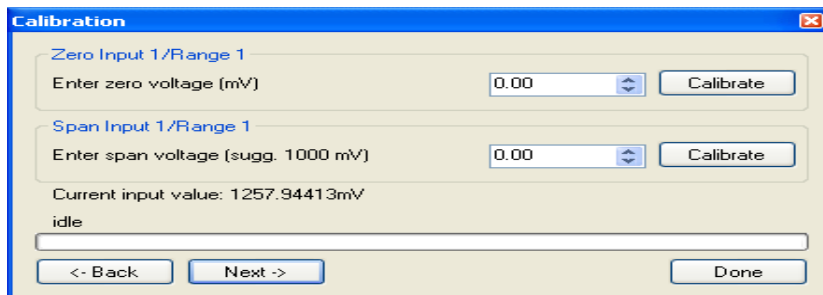
If adjusting the input by a preset amount for all temperature points please calibrate the cold junction by entering a new value plus or minus the difference of the value indicated. Wait 120 seconds and verify with a source calibration device with the correct T/C type. In the "Calibrate Cold Junction" section, enter the temperature of the terminals and click on the **Calibrate** button. This will calibrate the cold junction value. *Note: During a normal calibration procedure, the user should zero and span all of the inputs first and then perform a cold junction calibration, if necessary.*



Configurator – Calibration screen

Step 2. Zero then Span Calibration.

Clicking on the **Next ->** button will display the second screen (Input 1 calibration) for the user calibration. Begin here for only calibrating the inputs terminals 27-32. ***Cold junction will be completed as a final step.***



Configurator – User Calibration screen 2

In the "Zero Input 1/Range 1" section, enter the zero voltage and click on the **Calibrate** button. This will calibrate the zero range.

In the "Span Input 1/Range 1" section, enter the span voltage that you are sourcing in and click on the **Calibrate** button. This will calibrate the span range.

Clicking on the **Next ->** button will display the third screen for the user calibration. Clicking on the **<- Back** button will display the previous screen.

Calibration

Zero Input 2/Range 3
Enter zero voltage (mV) 0.00 Calibrate

Span Input 2/Range 3
Enter span voltage (sugg. 17.500 mV) 0.00 Calibrate

Current input value: 19.82304mV
idle

<- Back Next -> Done

Configurator – User Calibration screen 3

Calibrate the zero/span range for input 2 and click on the **Next ->** button to continue to the fourth screen. Clicking on the **<- Back** button will display the previous screen.

Calibration

Zero Input 3/Range 2
Enter zero voltage (mV) 0.00 Calibrate

Span Input 3/Range 2
Enter span voltage (sugg. 65.000 mV) 0.00 Calibrate

Current input value: 78.58312mV
idle

<- Back Next -> Done

Configurator – User Calibration screen 4

Calibrate the zero/span range for input 3 and click on the **Next ->** button to continue to the fifth screen. Clicking on the **<- Back** button will display the previous screen.

Calibration

Zero Output 1
Enter zero output current (mA) 0.00 Calibrate

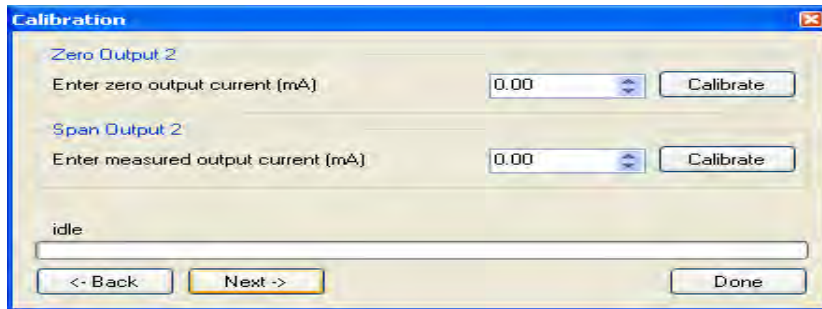
Span Output 1
Enter measured output current (mA) 0.00 Calibrate

idle

<- Back Next -> Done

Configurator – User Calibration screen 5

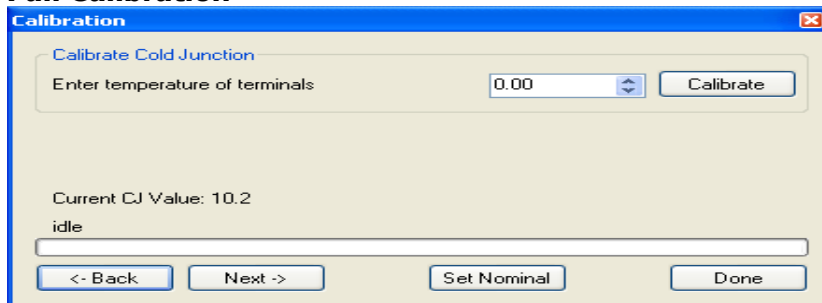
To calibrate the zero/span range for output 1, you must first attach your measuring device, then select prep for Zero. Let the unit output what it has set for the zero measurement, then enter what you are measuring coming out of the terminals. Once entered select Calibrate and let the procedure finish. This will be the same for the Span output. Then click on the **Next ->** button to continue to the sixth screen. Clicking on the **<- Back** button will display the previous screen.



Configurator – User Calibration screen 6

Calibrate the zero/span range for output 2 following the same procedure as before with output 1. Clicking on the **<- Back** button will display the previous screen. This is the last screen for user calibration. Click on the **Done** button to close the screen down, or return to step 1 for cold junction calibration.

Full Calibration



Configurator – Full Calibration screen 1

The *Calibration* screen for the Full Calibration menu option is identical in function and layout to the User Calibration's *Calibration* screen. The only difference is the Full Calibration's *Calibration* screen contains more screens. This list of screens is listed below in sequential order. Screens only found in the Full Calibration menu option are displayed in *Italics*. Screens only found in the User Calibration menu option are displayed in **bold**.

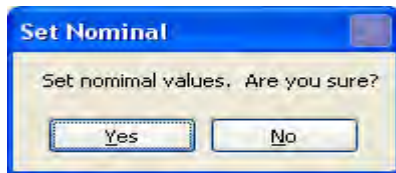
1. Cold Junction
2. *Zero/Span Input 0/Range 0*
3. *Zero/Span Input 0/Range 1*
4. *Zero/Span Input 0/Range 2*
5. *Zero/Span Input 0/Range 3*
6. *Zero/Span Input 1/Range 0*
7. *Zero/Span Input 1/Range 1*
8. *Zero/Span Input 1/Range 2*
9. *Zero/Span Input 1/Range 3*
10. *Zero/Span Input 2/Range 0*
11. *Zero/Span Input 2/Range 1*
12. *Zero/Span Input 2/Range 2*
13. *Zero/Span Input 2/Range 3*
14. **Zero/Span Input 3/Range 2**
15. *Zero/Span Input 1 Range Jumper*
16. *Zero/Span Input 2 Range Jumper*

17. Zero/Span Input 3 Range Jumper

18. Zero/Span Output 1

19. Zero/Span Output 2

The *Calibration* screen for the Full Calibration menu option also has a **Set Nominal** button, which will set nominal values for the current screen. The user will have to confirm the action.



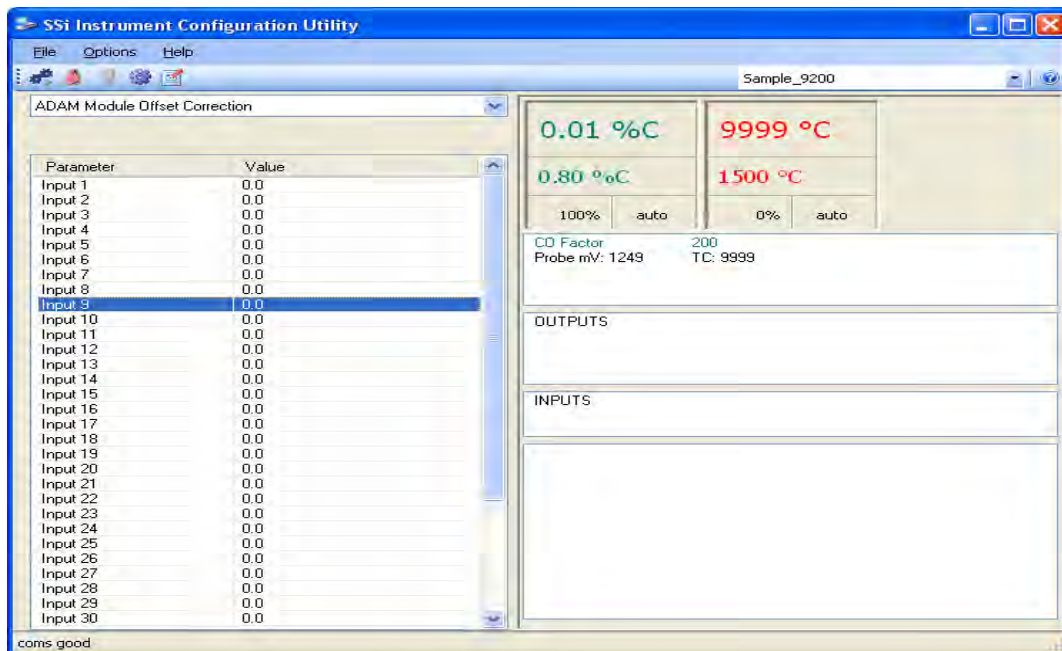
Configurator – Full Calibration confirm set nominal values

Clicking on the **Yes** button will set the nominal values, and clicking on the **No** button will cancel the action.

Click the **Done** button to close the screen down.

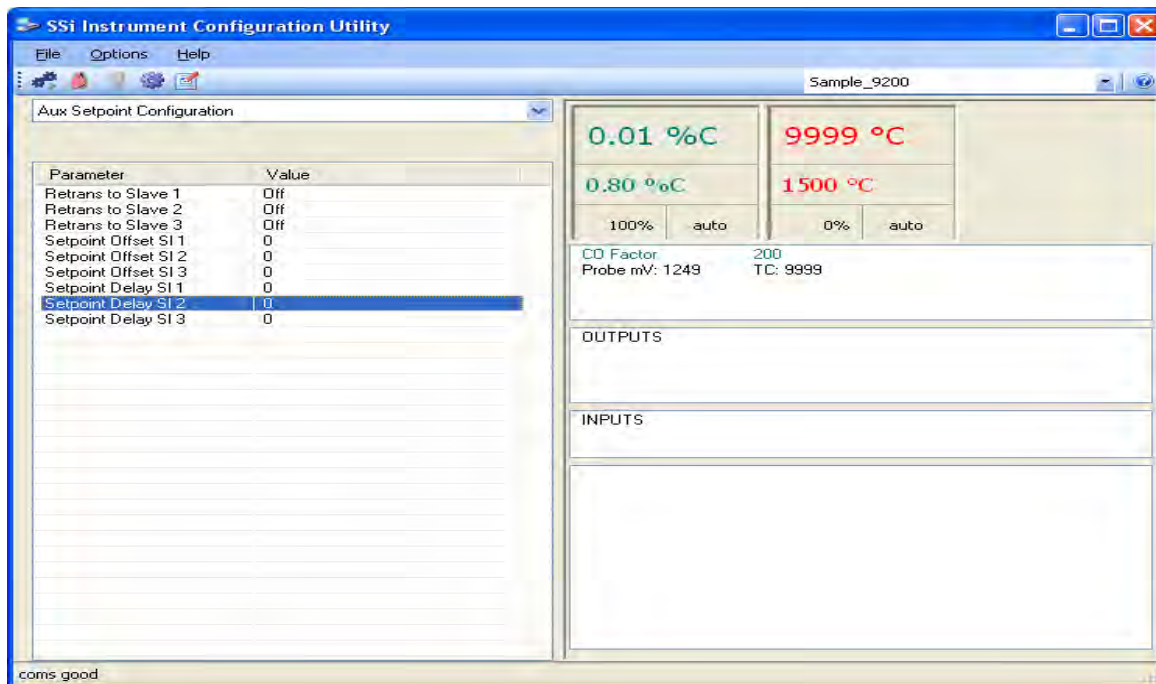
ADAM Module Offset Correction

The ADAM Module Offset Correction menu option gives the user the ability to offset any input (1-40) on any ADAM Module (1 – 5). There are eight (8) inputs per ADAM module. Therefore, input 9 is actually Module 2 Input 1, and input 27 is actually Module 4 Input 3. The offset can be in degrees **+** or **–**, and it is typically used to compensate for incorrect T/C wires. Clicking on any of the values will display an input box from which the user can select a new offset. The range is **–50.0** to **50.0**.



Configurator - ADAM Module Offset Correction menu option

Aux Setpoint Configuration



Configurator – Aux Setpoint Configuration menu option

See the menu option *Slave Instruments* for configuration prior to using *Aux Setpoint Configuration*. This menu option allows for up to 3 slave instruments to have the setpoint retransmitted from one of the three control loops. This menu option is typically used to retransmit an alarm setpoint value to an overtemp controller.

Offset:

Carbon - 1 = 0.01

Temperature - 1 = 1

Delay:

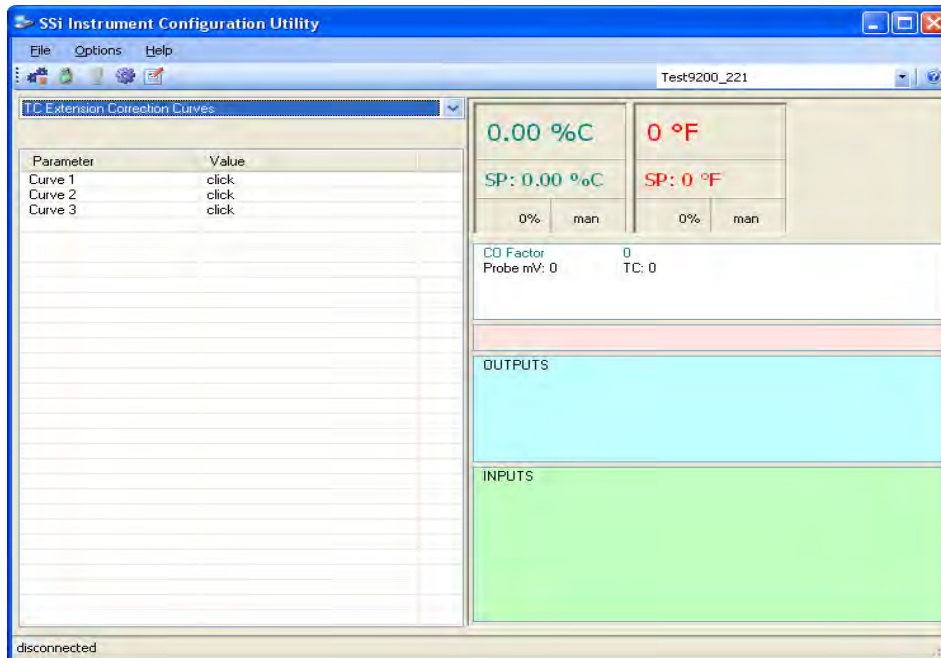
This is measured in seconds

Clicking on the values for "Retrans To Slave 1", "Retrans to Slave 2", or "Retrans to Slave 3" will display an input box with a drop-down list from which the user can select the new value. The options are:

- Off
- Loop 1
- Loop 2
- Loop 3

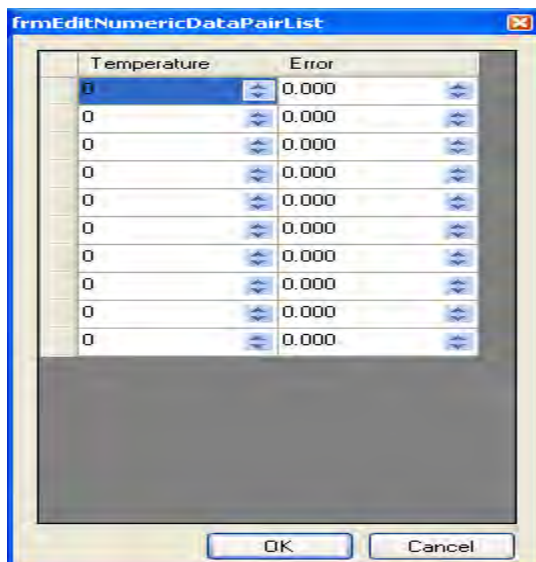
Clicking on any of the values for "Setpoint Offset SI 1", "Setpoint Offset SI 2", "Setpoint Offset SI 3", "Setpoint Delay SI 1", "Setpoint Delay SI 2", or "Setpoint Delay SI 3" will display an input box from which the user can select the new value. The range is **-32768** to **32767**.

TC Extension Correction Curves



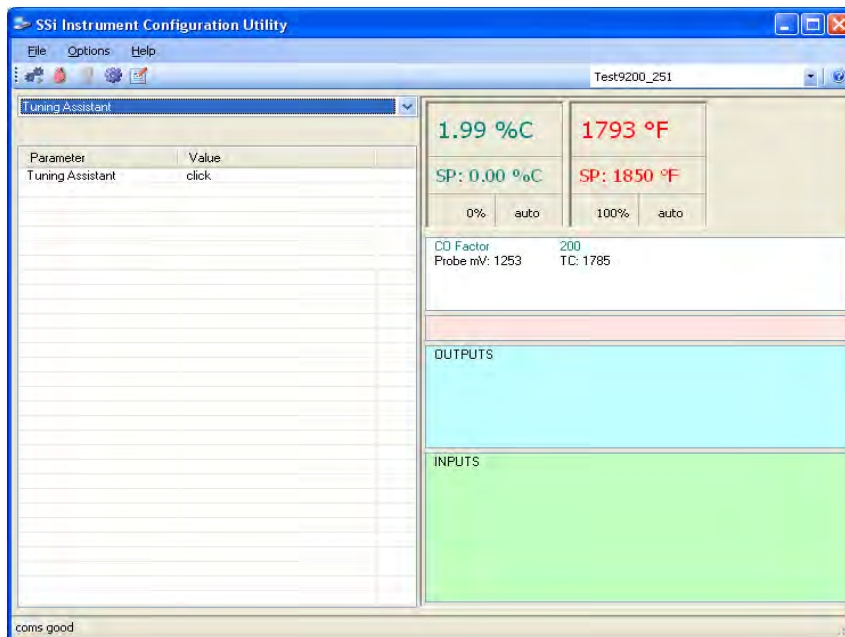
Configurator – TC Extension Correction Curves menu option

This menu option will allow the user to set up to three TC correction curves for the 9200 controller. Clicking on the "click" value for a curve will display the curve edit form. *Note: If the first "Temperature" value and the first "Error" value are both zero, then the curve will not be set.* The user can enter up to ten "Temperature"/"Error" combinations. The range for the "Temperature" field is **–300** to **9999**. The range for the "Error" field is **–30.000** to **30.000**.



Configurator – Curve edit form

Tuning Assistant



Configurator – Tuning Assistant screen

The tuning assistant will allow the user to automatically generate the PID settings for a specific loop. Click on the “click” value to start the tuning assistant.



Configurator - Tuning Assistant Form

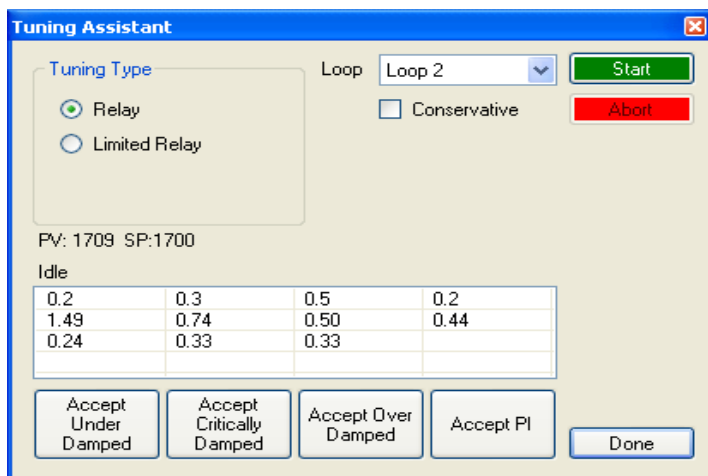
The user can select the loop to auto tune from the drop-down list next to the “Loop” label. The choices are: **Loop 1**, **Loop 2**, or **Loop 3**. The type of tuning to be used can be selected from the “Tuning Type” section in the top left of the form. The options are either **Relay** or **Limited Relay**. Using the **Relay** option will just use 100% output while the 9200 is controlling the furnace. The **Limited Relay** option will reduce the % output by a user-specified amount. When the **Limited Relay** option is selected, the “Tuning Delta:” label and the **Edit** button will be visible. When the **Relay** option is selected, these two items will be invisible. Clicking on the **Edit** button will allow the user to select the new % output value. The “Conservative” option

will allow the user to minimize, if not remove, the possibility for an overshoot of the setpoint. If a small overshoot is acceptable, leave the "Conservative" checkbox unchecked. If, however, no overshoot is desired, then checking the "Conservative" checkbox will accomplish this. The current value for the process variable (PV) and the selected loop's setpoint (SP) will be displayed under the "Tuning Types" section. Click on the **Start** button to begin the auto tune process. *Note: The process may take a few seconds to start.* Once the process has started, the "Idle" line will change to "Tuning: Pointer xx". This means that the calibration process is working. When the calibration is finished, the "Tuning: Pointer xx" line will read "Idle" again, and the list underneath will be populated with suggested PID settings. *Note: clicking on the **Done** button while the tuning is in progress will close down the screen, but the user will have to confirm the action. However, clicking on the **Abort** button will simply abort the calibration process.*



Configurator – Abort Autotune message box

Clicking on the **Yes** button will abort the calibration and close down the screen, while clicking on the **No** button will cancel the abort process.




Configurator – Tuning Assistant with suggested PID settings

Each column for the PID settings relates to the button below. For example, the second column is the PID settings for the Critically Damped values. The user can accept only one set of numbers. To select a set of values, click on the corresponding button. For example, to accept the critically damped values, click on the **Accept Critically Damped** button.

The under damped values will reach the setpoint faster, but there will be more overshoot involved. The over damped values will work to minimize the overshoot, but it will be slower than the under damped values. The critically damped values are considered the "optimum" values because they are a balance between the under damped and over damped values with regards to time and overshoot. The PI values are just the proportional band and the reset

value (the P and the I from PID). This could be applicable in an atmosphere loop, where the rate won't have much effect.

Once a set of values has been accepted, the user can press the **Done** button to exit the screen. The accepted values can be viewed on the *PID Loop Setup* menu option. *Note: Once the screen is closed out, the PID settings values will be lost.* To populate these values again, another calibration routine will need to be run.



Configurator – 9205 Drop-Down Menu

Burnoff

*** This menu option is the same as the *Burnoff* menu option under the *Configurator-9200 Drop Down Menu*. ***

Slave Instruments

*** This menu option is the same as the *Slave Instruments* menu option under the *Configurator-9200 Drop Down Menu*. ***

Auxiliary Analog Input

*** This menu option is the same as the *Auxiliary Analog Input* menu option under the *Configurator-9200 Drop Down Menu*. ***

Manual Event Control

*** This menu option is the same as the *Manual Event Control* menu option under the *Configurator-9200 Drop Down Menu*. ***

Probe Burnoff Setup

*** This menu option is the same as the *Probe Burnoff Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

PID Loop Setup

*** This menu option is the same as the *PID Loop Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Event Run Program Setup

*** This menu option is the same as the *Event Run Program Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Zone/Load TC Setup

*** This menu option is the same as the *Zone/Load TC Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Port Setup

*** This menu option is the same as the *Port Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Slave Instrument Setup

*** This menu option is the same as the *Slave Instrument Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Zone Assignments

*** This menu option is the same as the *Zone Assignments* menu option under the *Configurator-9200 Drop Down Menu*. ***

Furnace Setup

*** This menu option is the same as the *Furnace Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Default Wait Limits

*** This menu option is the same as the *Default Wait Limits* menu option under the *Configurator-9200 Drop Down Menu*. ***

Furnace Name

*** This menu option is the same as the *Furnace Name* menu option under the *Configurator-9200 Drop Down Menu*. ***

Alarm Setup

*** This menu option is the same as the *Alarm Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Relay Assignments

*** This menu option is the same as the *Relay Assignments* menu option under the *Configurator-9200 Drop Down Menu*. ***

Relay Setpoints

*** This menu option is the same as the *Relay Setpoints* menu option under the *Configurator-9200 Drop Down Menu*. ***

Analog Input Setup

*** This menu option is the same as the *Analog Input Setup* menu option under the *Configurator-9220 Drop Down Menu*. ***

Analog Output Setup

*** This menu option is the same as the *Analog Output Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Passcode and Alarm

*** This menu option is the same as the *Passcode and Alarm* menu option under the *Configurator-9200 Drop Down Menu*. ***

IP Address

*** This menu option is the same as the *IP Address* menu option under the *Configurator-9200 Drop Down Menu*. ***

Event Control

*** This menu option is the same as the *Event Control* menu option under the *Configurator-9200 Drop Down Menu*. ***

Set Menu Security

*** This menu option is the same as the *Set Menu Security* menu option under the *Configurator-9200 Drop Down Menu*. ***

Curve Entry

*** This menu option is the same as the *Custom Curves* menu option under the *Configurator-9200 Drop Down Menu*. ***

Alternate PID Setup

*** This menu option is the same as the *Alternate PID Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

SSi Analog Input Setup

*** This menu option is the same as the *SSi Analog Input Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

SSi Configuration and Calibration

*** This menu option is the same as the *SSi Configuration and Calibration* menu option under the *Configurator-9200 Drop Down Menu*. ***

ADAM Module Offset Correction

*** This menu option is the same as the *ADAM Module Offset Correction* menu option under the *Configurator-9200 Drop Down Menu*. ***

Aux Setpoint Configuration

*** This menu option is the same as the *Aux Setpoint Configuration* menu option under the *Configurator-9200 Drop Down Menu*. ***



Configurator – 9210 Drop-Down Menu

Slave Instruments

*** This menu option is the same as the *Slave Instruments* menu option under the *Configurator-9200 Drop Down Menu*. ***

Auxiliary Analog Input

*** This menu option is the same as the *Auxiliary Analog Input* menu option under the *Configurator-9200 Drop Down Menu*. ***

Manual Event Control

*** This menu option is the same as the *Manual Event Control* menu option under the *Configurator-9200 Drop Down Menu*. ***

PID Loop Setup

*** This menu option is the same as the *PID Loop Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Event Run Program Setup

*** This menu option is the same as the *Event Run Program Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Zone/Load TC Setup

*** This menu option is the same as the *Zone/Load TC Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Port Setup

*** This menu option is the same as the *Port Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Slave Instrument Setup

*** This menu option is the same as the *Slave Instrument Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Zone Assignments

*** This menu option is the same as the *Zone Assignments* menu option under the *Configurator-9200 Drop Down Menu*. ***

Furnace Setup

*** This menu option is the same as the *Furnace Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Default Wait Limits

*** This menu option is the same as the *Default Wait Limits* menu option under the *Configurator-9200 Drop Down Menu*. ***

Furnace Name

*** This menu option is the same as the *Furnace Name* menu option under the *Configurator-9200 Drop Down Menu*. ***

Alarm Setup

*** This menu option is the same as the *Alarm Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Relay Assignments

*** This menu option is the same as the *Relay Assignments* menu option under the *Configurator-9200 Drop Down Menu*. ***

Relay Setpoints

*** This menu option is the same as the *Relay Setpoints* menu option under the *Configurator-9200 Drop Down Menu*. ***

Analog Input Setup

*** This menu option is the same as the *Analog Input Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Analog Output Setup

*** This menu option is the same as the *Analog Output Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Passcode and Alarm

*** This menu option is the same as the *Passcode and Alarm* menu option under the *Configurator-9200 Drop Down Menu*. ***

IP Address

*** This menu option is the same as the *IP Address* menu option under the *Configurator-9200 Drop Down Menu*. ***

Event Control

*** This menu option is the same as the *Event Control* menu option under the *Configurator-9200 Drop Down Menu*. ***

Valve Configuration

*** This menu option is the same as the *Valve Configuration* menu option under the *Configurator-9215 Drop Down Menu*. ***

Valve Setup

*** This menu option is the same as the *Valve Setup* menu option under the *Configurator-9215 Drop Down Menu*. ***

Set Menu Security

*** This menu option is the same as the *Set Menu Security* menu option under the *Configurator-9200 Drop Down Menu*. ***

Curve Entry

*** This menu option is the same as the *Custom Curves* menu option under the *Configurator-9200 Drop Down Menu*. ***

Alternate PID Setup

*** This menu option is the same as the *Alternate PID Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

SSi Analog Input Setup

*** This menu option is the same as the *SSi Analog Input Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

SSi Configuration and Calibration

*** This menu option is the same as the *SSi Configuration and Calibration* menu option under the *Configurator-9200 Drop Down Menu*. ***

ADAM Module Offset Correction

*** This menu option is the same as the *ADAM Module Offset Correction* menu option under the *Configurator-9200 Drop Down Menu*. ***

Aux Setpoint Configuration

*** This menu option is the same as the *Aux Setpoint Configuration* menu option under the *Configurator-9200 Drop Down Menu*. ***

TC Extension Correction Curves

*** This menu option is the same as the *TC Extension Correction Curves* menu option under the *Configurator-9200 Drop Down Menu*. ***

Tuning Assistant

*** This menu option is the same as the *Tuning Assistant* menu option under the *Configurator-9200 Drop Down Menu*. ***



Configurator – 9215 Drop-Down Menu

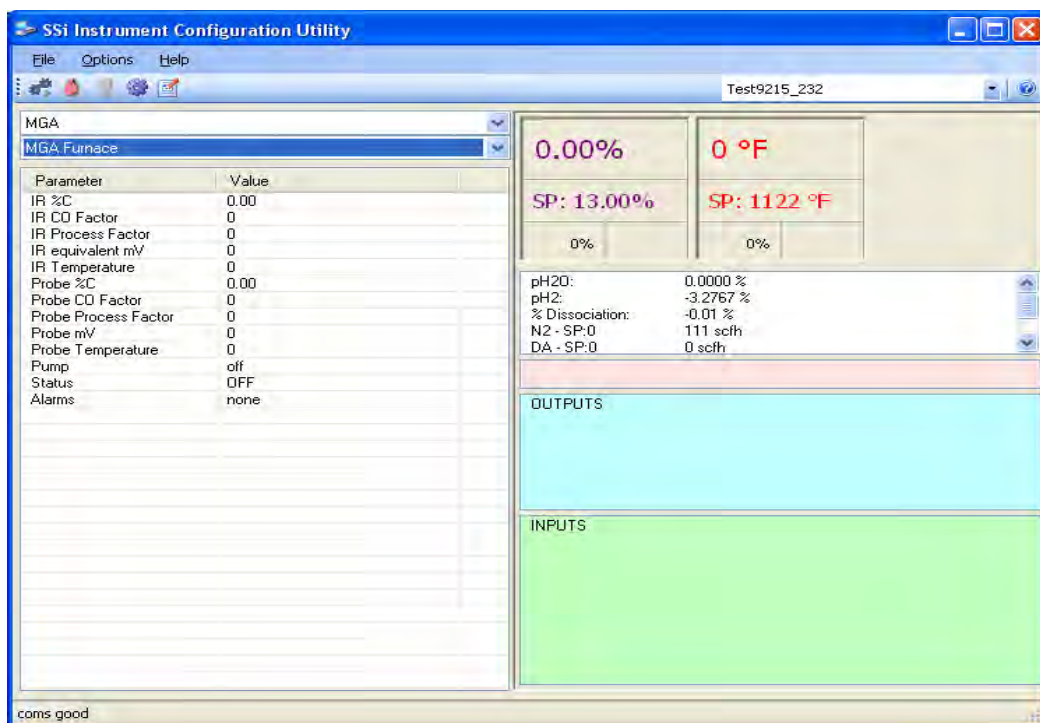
Slave Instruments

*** This menu option is the same as the *Slave Instruments* menu option under the *Configurator-9200 Drop Down Menu*. ***

Auxiliary A/I

*** This menu option is the same as the *Auxiliary Analog Input* menu option under the *Configurator-9200 Drop Down Menu*. ***

MGA



Configurator – MGA Menu Option

This option will allow the user to view the configuration for an **MGA Furnace** or an **MGA Endo**. *Note: The values on this screen are displays only and they cannot be modified.*

Manual Event Control

*** This menu option is the same as the *Manual Event Control* menu option under the *Configurator-9200 Drop Down Menu*. ***

PID Loop Setup

*** This menu option is the same as the *PID Loop Setup* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Event Run Program Setup

*** This menu option is the same as the *Event Run Program Setup* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Zone/Load TC Setup

*** This menu option is the same as the *Zone/Load TC Setup* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Port Setup

*** This menu option is the same as the *Port Setup* menu option under the *Configurator-9200 Drop-Down Menu*. ***

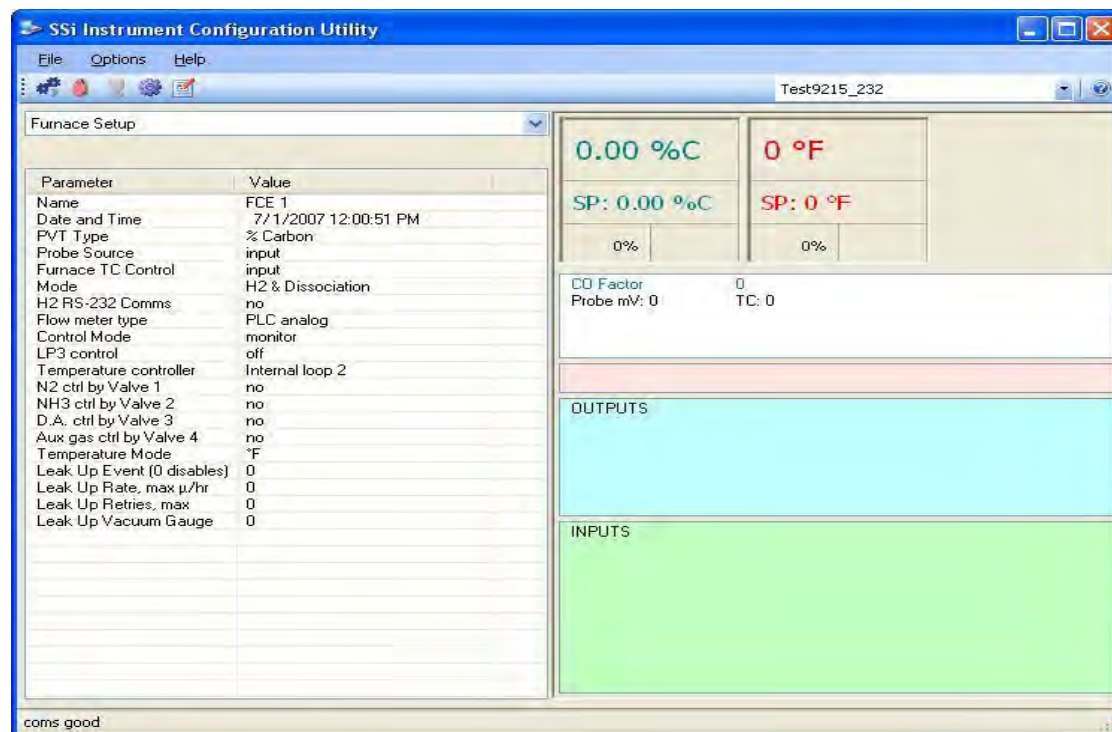
Slave Instrument Setup

*** This menu option is the same as the *Slave Instrument Setup* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Zone Assignments

*** This menu option is the same as the *Zone Assignments* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Furnace Setup



Configurator – Furnace Setup menu option

This menu option will allow the user to set up the furnace information for the 9215 controller.

Name:

This option will allow the user to set a descriptive name for the furnace.

Date and Time:

This option will display the date and time on the 9215 controller. This date/time can be modified by the user.

PVT Type:

This option will let the user set the PVT type for the controller. The options are: **% Carbon, Nitrider, or FNC.**

Probe Source:

This option will allow the user to set the probe source for the 9215 controller. The options are: **Input or PLC.**

Furnace TC Control:

This option will allow the user to set the TC control for the furnace. The options are: **Input or PLC.**

Mode:

This option will let the user set the mode of the controller. The options are: **H2 & Disassociation or H2 & Nitrider Potential.**

H2 RS-232 Comms:

This option will allow the user to determine if there will be RS-232 communications with the H2. The options are: **Yes or No.**

Flow Meter Type:

This option will allow the user to set the flow meter type for the controller. The options are: **PLC Analog or SSI RS485.**

Control Mode:

This option will allow the user to set the control mode for the controller. The options are: **Monitor or Control.**

LP3 Control:

This option will allow the user to set the control for the LP3. The options are: **None, Pressure Control, Not Defined, or Temperature.**

Temperature Controller:

This option will allow the user to define the temperature control for the 9215 controller. The options are: **Internal Loop 2 or SPP TC Instrument.**

N2 Ctrl by Valve 1:

This option will determine if the N2 can be controlled by valve 1. The options are: **No or Yes.**

NH3 Ctrl by Valve 2:

This option will determine if the NH3 can be controlled by valve 2. The options are: **No or Yes.**

D.A. Ctrl by Valve 3:

This option will determine if the D.A. (Disassociated Ammonia) can be controlled by valve 3. The options are: **No** or **Yes**.

Aux gas Ctrl by Valve 4:

This option will determine if the auxiliary gas can be controlled by valve 4. The options are: **No** or **Yes**.

Temperature Mode:

This option will set the temperature mode for the controller. The options are: °F (Degrees Fahrenheit) or °C (Degrees Celsius).

Leak Up Event (0 Disables):

This option will allow the user to set the leak up event number. The range is: **0** to **48**.

Leak Up Rate, Max μ /hr:

This option allows the user to set the maximum leak up rate. The range is: **0** to **65**.

Leak Up Retries, Max:

This option allows the user to set the maximum number of retries for the leak up process. The range is: **0** to **500**.

Leak Up Vacuum Gauge:

This option will allow the user to set the leak up gauge number. The range is: **1** to **4**.

Default Wait Limits

*** This menu option is the same as the *Default Wait Limits* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Alarm Setup

*** This menu option is the same as the *Alarm Setup* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Relay Assignments

*** This menu option is the same as the *Relay Assignments* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Relay Setpoints

*** This menu option is the same as the *Relay Setpoints* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Analog Input Setup

*** This menu option is the same as the *Analog Input Setup* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Analog Output Setup

*** This menu option is the same as the *Analog Output Setup* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Passcode and Alarm

*** This menu option is the same as the *Passcode and Alarm* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Generic Mapping Setups

*** This menu option is the same as the *Generic Mapping Setups* menu option under the *Configurator-9005 Drop-Down Menu*. ***

DF1 Configuration

*** This menu option is the same as the *DF1 Configuration* menu option under the *Configurator-9005 Drop-Down Menu*. ***

IP Address

*** This menu option is the same as the *IP Address* menu option under the *Configurator-9200 Drop-Down Menu*. ***

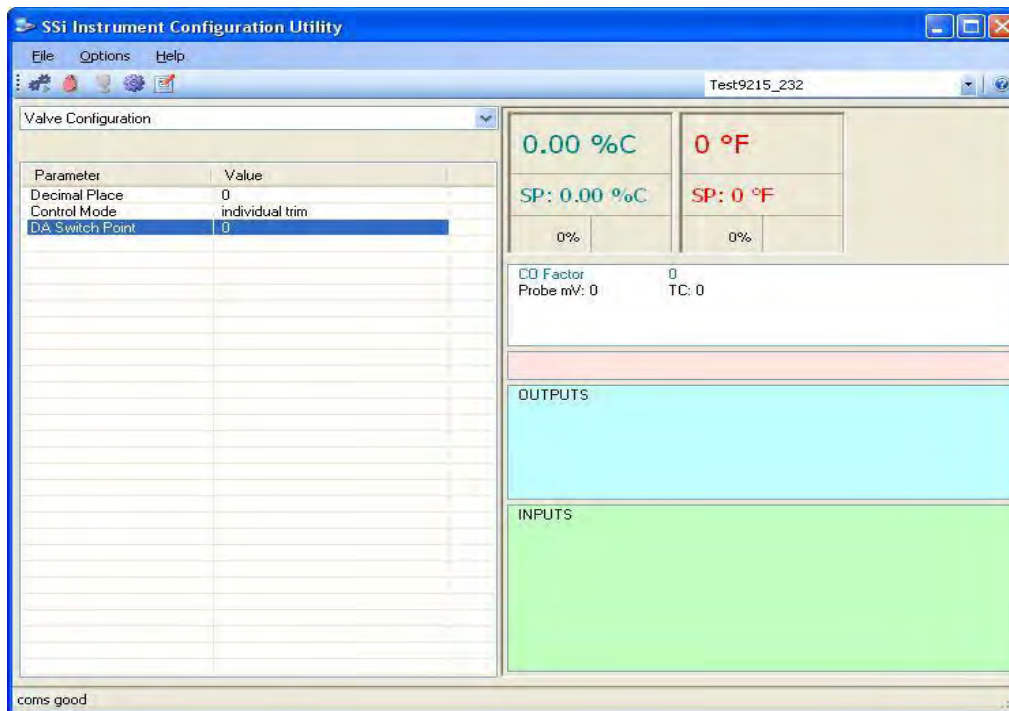
Event Control

*** This menu option is the same as the *Event Control* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Vacuum Gauge Setup

*** This menu option is the same as the *Vacuum Gauge Setup* menu option under the *Configurator-9005 Drop-Down Menu*. ***

Valve Configuration



Configurator – Valve Configuration Menu Option

This option will allow the user to configure the valve setup.

Decimal Place:

This option will set the decimal place for the valve setup. The range is **0** to **3**.

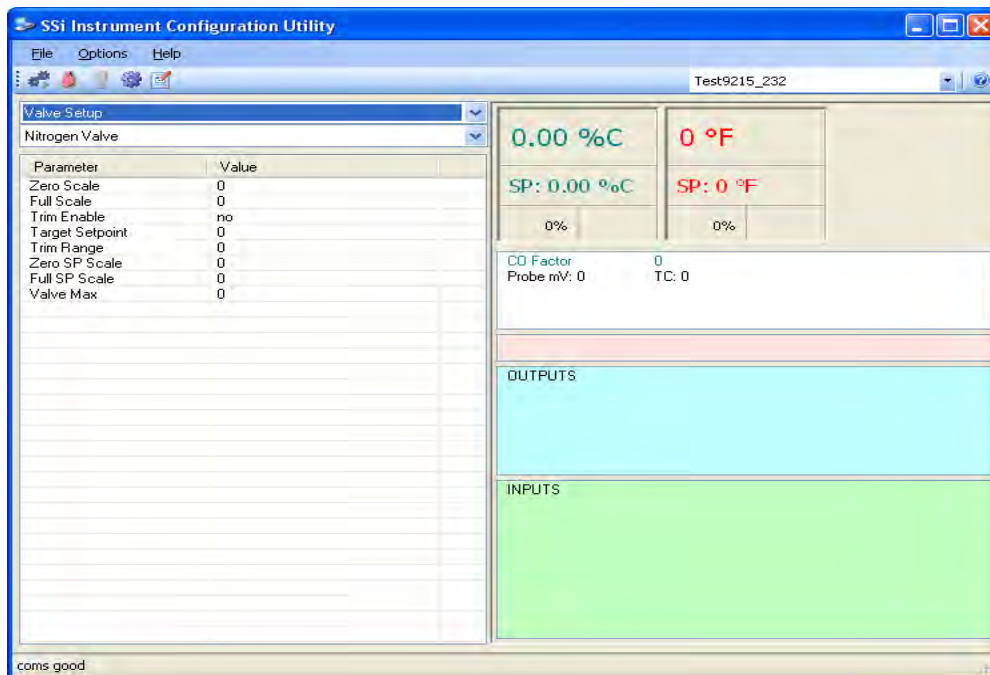
Control Mode:

This option will set the control mode for the valve setup. The options are: **Trim**, **Flow**, **Ratio**, or **Auto**.

DA Switch Point:

This option will set the switch point for the disassociated ammonia for the valve setup. The range is **0** to **100**.

Valve Setup



Configurator – Valve Setup menu option

This option will allow the user to set up the valves for the 9215 controller. There is a choice of four valves: **Nitrogen Valve**, **Ammonia Valve**, **D.A. (Disassociated Ammonia) Valve**, or **Hydrogen Valve**.

Zero Scale:

The Zero Scale option will allow the user to set the zero scale for the valve.

Full Scale:

This option will allow the user to set the full scale for the valve.

Trim Enable:

This option will allow the user to set the trim enable option for the valve.

Target Setpoint:

The Target Setpoint option will allow the user to set the target setpoint for the valve.

Trim Range:

This option will allow the user to set the trim range for the valve.

Zero SP Scale:

This option will allow the user to set the zero scale for the setpoint.

Full SP Scale:

This option will allow the user to set the full scale for the setpoint.

Valve Max:

This option will allow the user to set the maximum flow rate for the valve.

Custom Curves

*** This menu option is the same as the *Curve Entry* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Alternate PID Setup

*** This menu option is the same as the *Alternate PID Setup* menu option under the *Configurator-9200 Drop-Down Menu*. ***

SSi Analog Input Setup

*** This menu option is the same as the *SSi Analog Input Setup* menu option under the *Configurator-9200 Drop-Down Menu*. ***

SSi Configuration and Calibration

*** This menu option is the same as the *SSi Configuration and Calibration* menu option under the *Configurator-9200 Drop-Down Menu*. ***

ADAM Module Offset Correction

*** This menu option is the same as the *ADAM Module Offset Correction* menu option under the *Configurator-9200 Drop-Down Menu*. ***

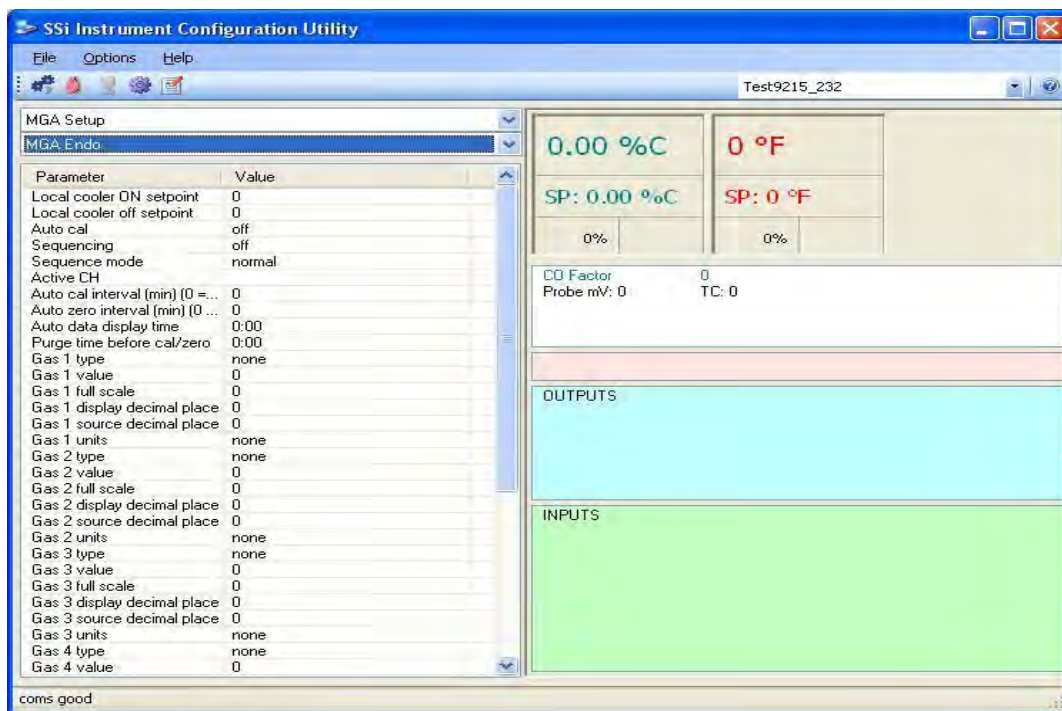
Aux Setpoint Configuration

*** This menu option is the same as the *Aux Setpoint Configuration* menu option under the *Configurator-9200 Drop-Down Menu*. ***

TC Extension Correction Curves

*** This menu option is the same as the *TC Extension Correction Curves* menu option under the *Configurator-9200 Drop-Down Menu*. ***

MGA Setup



Configurator – MGA Setup menu option

This option will allow the user to setup the configuration for an **MGA Furnace** or an **MGA Endo**.

Local Cooler ON Setpoint:

This option will allow the user to set the setpoint to turn the local cooler on. The range is: - **1000** to **4000**.

Local Cooler OFF Setpoint:

This option will allow the user to set the setpoint to turn the local cooler off. The range is: - **1000** to **4000**.

Auto Cal:

This option will turn the auto calibration process on or off. The options are: **On** or **Off**.

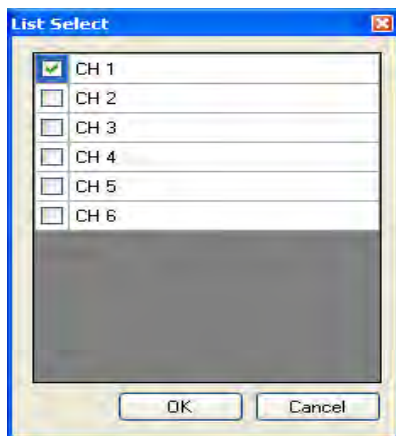
Sequencing:

This option will turn the sequencing process on or off. The options are: **On** or **Off**.

Sequence Mode:

This option will set the mode for the sequencing process. The options are: **Normal** or **Specific**.

Active CH:



Configurator – Active CH screen

This option will allow the user to select the active CH gas. The options are: **CH 1** through **CH 6**. *Note: More than one gas may be selected as the active CH value.*

Auto Cal Interval (min) (0 = OFF):

This option will set the auto cal interval in minutes. The range is: **0** to **9999**.

Auto Zero Interval (min) (0 = OFF):

This option will set the auto zero cal interval in minutes. The range is: **0** to **9999**.

Auto Data Display Time:

This is a display of the auto data time. This value cannot be modified.

Purge Time Before Cal/Zero:

This is a display of the purge time before the next calibration/zero process. This value cannot be modified.

Gas 1/2/3/4/5/6 Type:

This option will allow the user to select the gas type for the specified gas. The options are:

None	PIC 2 A/D1 O2 Cell
PIC IR Cell 1	PIC 2 A/D3 ext Thermister
PIC IR Cell 2	PIC 1 A/D3 ext 0-5V
PIC IR Cell 3	PIC 3 A/D0 ext 0-1V
PIC IR Cell 4	PIC 3 A/D1 ext 0-1V
H2 Cell via RS232	PIC 3 A/D3 ext 0-5V
Lambda Probe via RS485	

Gas 1/2/3/4/5/6 Value:

This option will display the current value for the specified gas. This value cannot be modified.

Gas 1/2/3/4/5/6 Full Scale:

This option will allow the user to set the full scale for the specified gas. The range is: **0** – **9999**.

Gas 1/2/3/4/5/6 Display Decimal Place:

This option will allow the user to set the display decimal places for the specified gas. The range is: **0** to **4**.

Gas 1/2/3/4/5/6 Source Decimal Place:

This option will allow the user to set the source decimal places for the specified gas. The range is: **0** to **4**.

Gas 1/2/3/4/5/6 Units:

This option will allow the user to set the units for the specified gas. The options are:

Blank

%

°F

°C

H2

O2



Configurator-9220 Drop-Down Menu

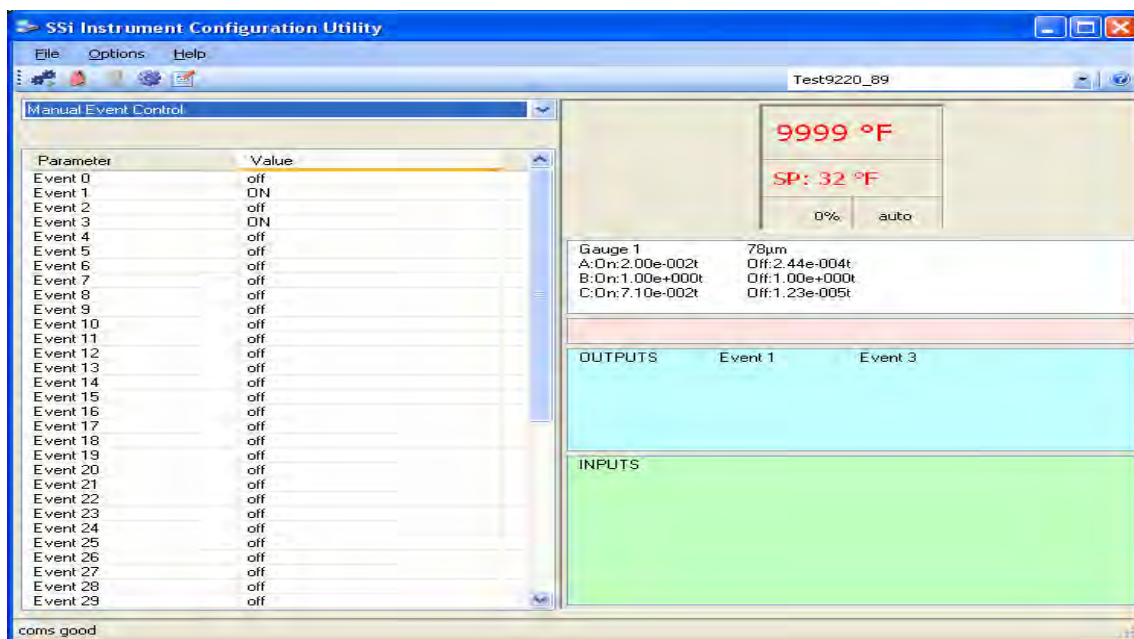
Slave Instruments

*** This menu option is the same as the *Slave Instruments* menu option under the *Configurator-9200 Drop Down Menu*. ***

Auxiliary Analog Input

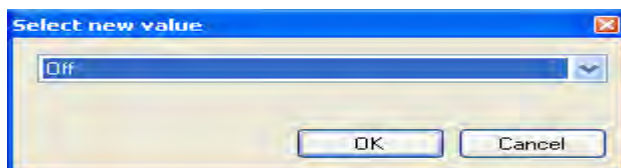
*** This menu option is the same as the *Auxiliary Analog Input* menu option under the *Configurator-9200 Drop Down Menu*. ***

Manual Event Control



Configurator – Manual Event Control menu option

The Manual Event Control menu option in the Configurator software shows the user all of the events (0 – 47) and their current status. It also allows the user to manually control the status of any event by clicking on the value. A single click will display an input box that will allow the user to select either an **On** value or an **Off** value.



Configurator – Select Manual Event Control value

Clicking on the **OK** button will set the value, while clicking on the **Cancel** button will cancel the action.

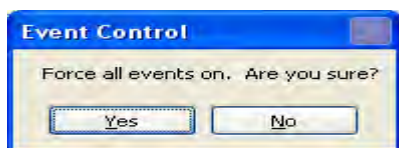
Clicking on the "Value" section of the "Turn off all events" field will force all of the events to **Off** status. The user will have to confirm this action.



Configurator – Confirm force off

Clicking on the **Yes** button will set the action, while clicking on the **No** button will cancel the action.

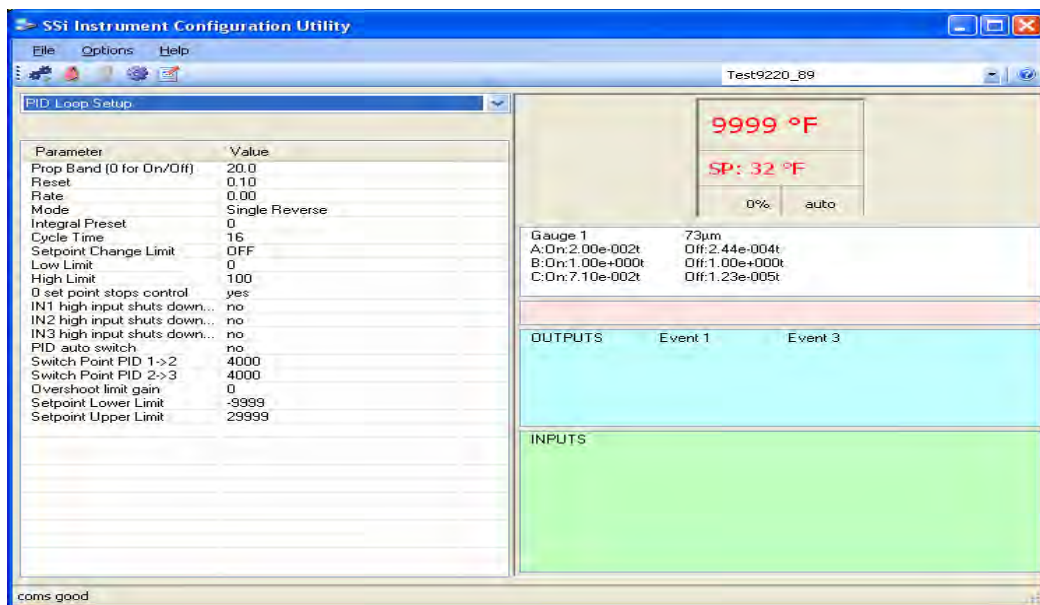
Clicking on the "Value" section of the "Turn ON all events" field will force all of the events to **On** status. The user will have to confirm this action.



Configurator – Confirm force on

Clicking on the **Yes** button will set the action, while clicking on the **No** button will cancel the action.

PID Loop Setup



Configurator – PID Loop Setup menu option

PID is the tuning parameters entered for the Process Variable loop.

Prop Band (0 for On/Off)

This is the proportional band field. The range 0 – 999.0

Reset

This is the reset field. The range 0 – 100.00

Rate

This is the rate field. The range is 0 – 100.00. The rate is not typically used for heating/carbon

Mode

This is the mode of the loop. The values are: **Dual Reverse, Single Reverse, Dual Direct,** or **Single Direct.**

Integral Preset

This field provides an offset for the starting point for PID control, also referred to as "Load Line" or "Manual Reset". The range is **–100** to **100**.

Cycle Time

This field is typically set to the valve travel time multiplied by 1.5.

Setpoint Change Limit

This is a smart time feature that allows Process Loop to use PB only without Reset until the Process Variable drops below the percent output set under this category.

It is used to eliminate overshoot.

The Output percentage selected under this category ***must*** be above the normal operating output percentage of the furnace at heat.

Example – if the furnace runs at 40% output at heat for the maximum load, the setpoint change limit should be set to 60%.

Low Limit

This is the low limit field. The range is **–100** to **100**.

High Limit

This is the high limit field. The range is **–100** to **100**.

0 Setpoint Stops Control

If the Setpoint is zero, then all outputs are turned off. The option is either **Yes** or **No**.

IN1 high limit shuts down ctrl

If input 1's high limit is reached, then all outputs are turned off. The value can either be **Yes** or **No**.

IN2 high limit shuts down ctrl

If input 2's high limit is reached, then all outputs are turned off. The value can either be **Yes** or **No**.

IN3 high limit shuts down ctrl

If input 3's high limit is reached, then all outputs are turned off. The value can either be **Yes** or **No**.

PID Auto Switch

This is the PID auto switch field. The value can either be **Yes** or **No**.

Switch Point PID 1 -> 2

This is the PID Switch Point field. The range is **–300** to **4000**.

Switch Point PID 2 -> 3

This is the PID Switch Point field. The range is **–300** to **4000**.

Overshoot Limit Gain

This is the Overshoot limit gain field. The range is **0** to **9999**.

Setpoint Lower Limit

This is the lower limit of the setpoint. The range is **–300** to **9999**.

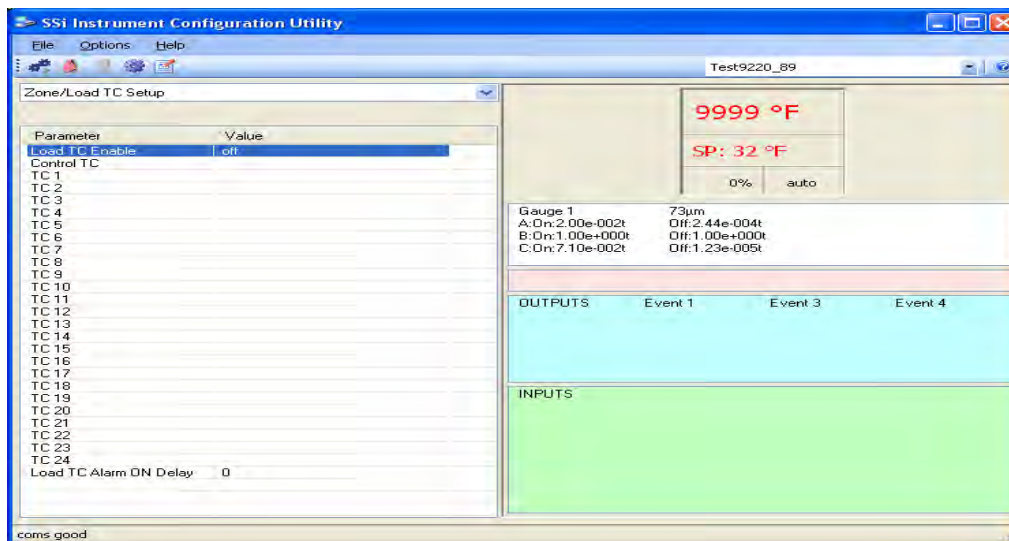
Setpoint Upper Limit

This is the upper limit for the setpoint. The range is **–300** to **9999**.

Event Run Program Setup

*** This menu option is the same as the *Event Run Program Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

Zone/Load TC Setup



Configurator – Zone/Load TC Setup menu option

Configuration of any analog input device must be completed under this menu item.

Load TC Enable:

This value will manually toggle between **on**, **on + alarms**, and **off**.

On – T/C Enabled

On + Alarms – T/C Enabled, Programmer alarm114 provided if out of band (Default wait limits)

Off – T/C not enabled

Control TC:

This value allows the user to set the TC to be part of the group of Load TCs that can hold the program if it is out of band. The values are **active** or **not active**, shown as blank.

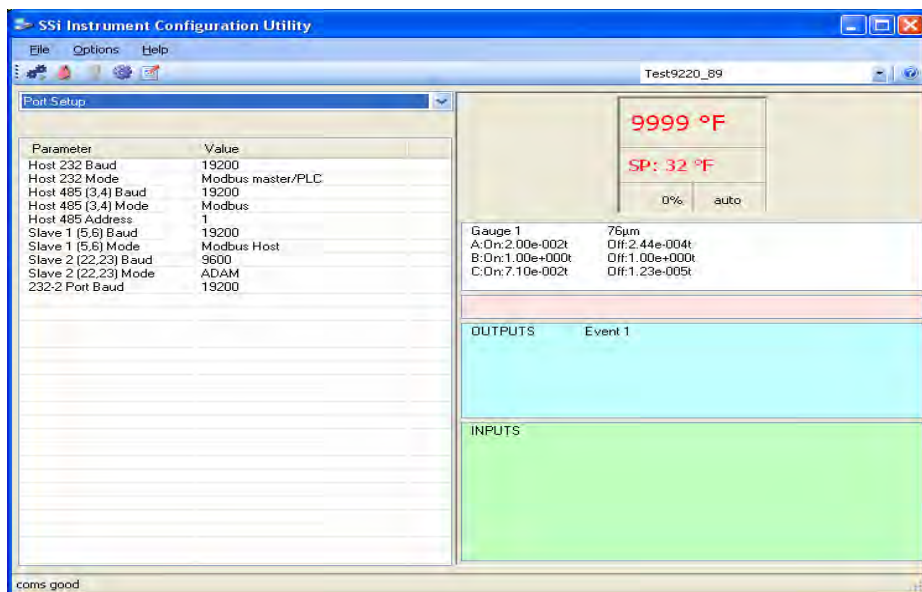
TC 1 – 24:

This value allows the user to manually turn the T/C from **active** to **not active**, shown as blank, to be part of the group of TCs that can hold the program if it's out of band.

Load TC Alarm ON Delay:

This is the amount of time the alarm will delay before turning on. The range is **0** to **500**, measured in seconds.

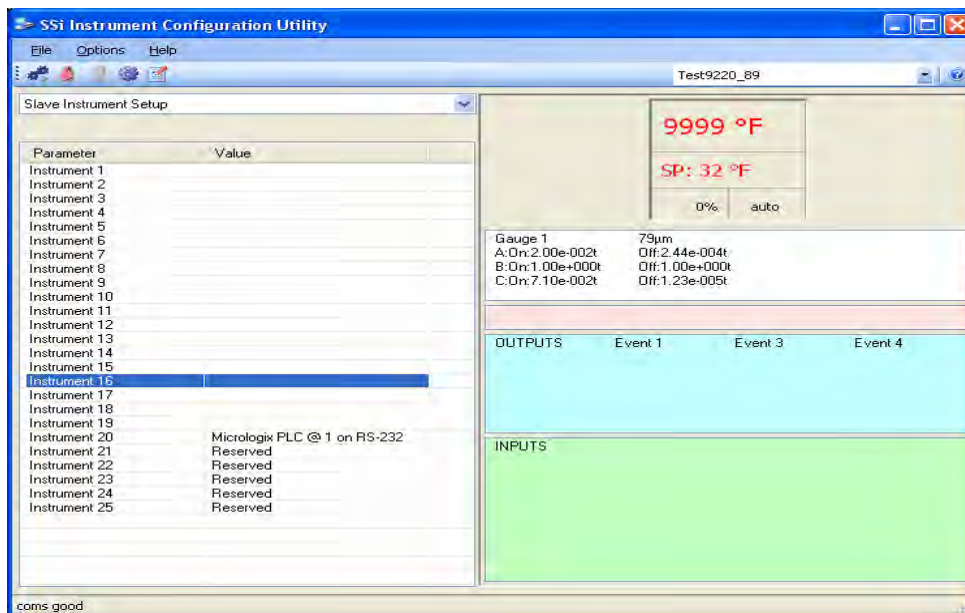
Port Setup



Configurator – Port Setup menu option

Port setup is the communications definitions for the controller. Please contact Super Systems Inc. for more information regarding port setup. It is *strongly recommended* that none of the settings be modified without technical support from Super Systems Inc. Clicking on any of the values will display an input box that will allow the user to modify the current settings.

Slave Instrument Setup

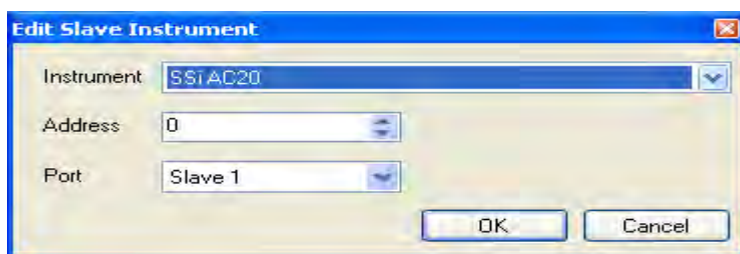


Configurator – Slave Instrument Setup menu option

Configurator - Instrument Setup menu option

** All devices on the same slave port must utilize the same protocol
** An address of zero (0) will disable the instrument** Some controllers (AC20 for example) can provide dual functions (atmosphere and events) and must have the same address assigned for both.

Clicking on the "Value" field for any instrument will allow the user to select the slave instrument.



Configurator – Edit Slave Instrument screen

Instrument:

This value will allow the user to select the slave instrument type.

List of Instruments:

The following is the list of instruments available as slave instruments:

SSi AC20	[T]Eurotherm 2500	SSi Quad AO2
[A]Yokogawa 750	Unipro v3.5	SSi Quad AO3
[A]Honeywell UDC3300	Unipro v3.0	SSi Quad AO4
[A]Dualpro LP1 Modbus	[T]Carbpro v3.5 Slave	Yokogawa UT350

[A]Dualpro LP2 Modbus	[T]Carbpro v3.0 Slave	Yokogawa 750 Lp 2
[A]Dualpro LP1 MMI	10Pro	Yokogawa UP350
[A]Dualpro LP2 MMI	Dualpro IN C	Honeywell DCP551
[A]Eurotherm 2404	[T]9200 LP1	Ascon 08
[A]Eurotherm 2500	[T]9200 LP2	SSi AC E
[A]Cabpro v3.5	[T]9200 LP3	Yokogawa 750E
[A]Cabpro v3.0	9100 LP2	Mod Mux
CarbPC	Eurotherm 2704 LP1	Dualpro E Modbus
[A]9200 LP1	Eurotherm 2704 LP2	Dualpro E MMI
IR Base	Eurotherm 2704 LP3	Carbpro E v3.5
MGA	VC Base 1	Carbpro E v3.0
SSi 7EK	VC Base 2	Eurotherm 2500
[T]Yokogawa 750	VC Base 3	SSi 8-8
[T]Honeywell UDC3300	VC Base 4	SSi 9200 E
[T]Dualpro LP1 Modbus	AIPC	Micrologix PLC
[T]Dualpro LP2 Modbus	SSi 7SL	MCM Module
[T]Dualpro LP1 MMI	SSi Flow Board	PLC5 DF1
[T]Dualpro LP2 MMI	UMC800 LP1	SLK DF1
[T]Eurotherm 2404	SSi Quad AO1	

Address:

This value allows the user to select the address that corresponds with the controller selected, with a range of 0 to 249.

Port:

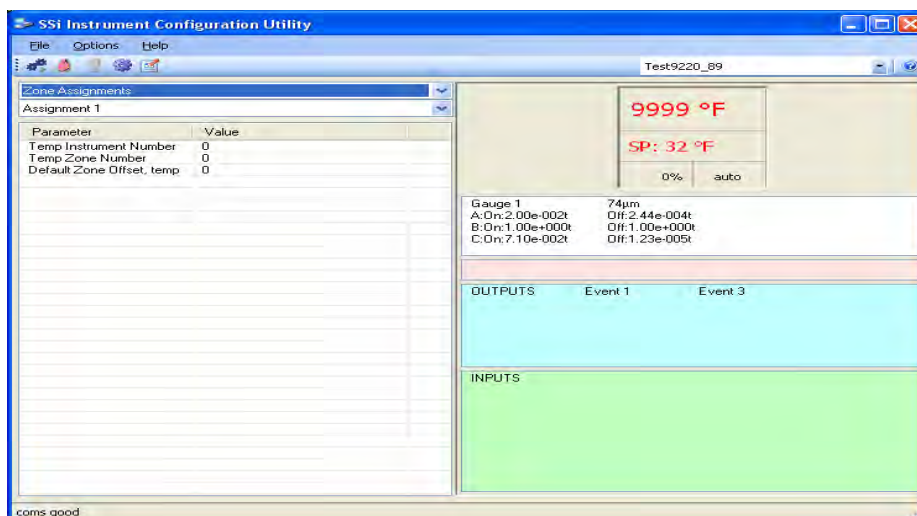
The options for this field can either be **Slave 1** or **Slave 2**

Slave 1 – terminals 5(-), 6(+)

Slave 2 – terminals 22(+), 23(-)

RS-232

Zone Assignments



Configurator – Zone Assignments menu option

A zone assignment on the 9220 controller allows the recipe programs to change setpoints on all slave instruments of a multi-zone furnace (up to 5 zones).

*Only used when running recipes

*Slave Instrument Setup must be configured prior to Zone Assignment setup

** Temperature zones link instruments to Temperature Setpoints

Assignments:

The zone assignment number, with a choice of **Assignment 1** through **Assignment 5**.

Temp Instrument Number:

The slave instrument number assigned to a temperature controller, with a range of **0** to **25**.

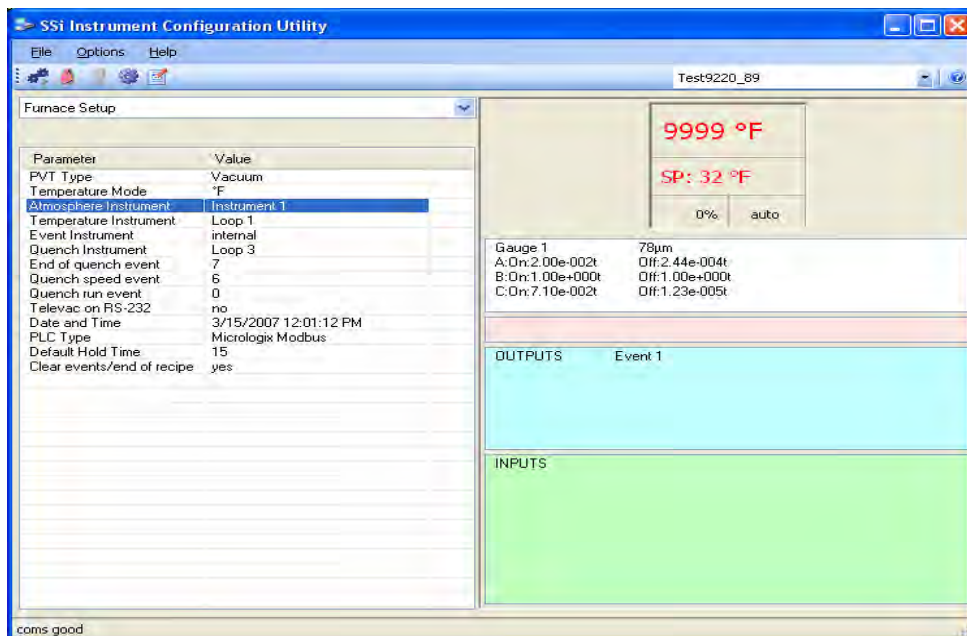
Temp Zone Number:

The zone within which the temperature setpoint change is desired, with a range of **0** to **5**.

Default Zone Offset, temp:

This is the default zone offset for temperature, with a range of **-32000** to **32000**.

Furnace Setup



Configurator – Furnace Setup menu option

The Furnace Setup menu option is an administrative access only option. Do not make any adjustments on the screen without first contacting Super Systems Inc..

PVT Type:

The PVT type is the mode the device runs in (Carbon, Dewpoint, etc.). The mode selected determines the calculations and scaling for the Process Variable. Any time this selection is changed it is necessary to reset the factory defaults to ensure all parameters have been changed to the new Process Variable. Clicking on this value will display an input box with a

drop-down list from which the user can select a new PVT Type. The values for the PVT type are: **% Carbon, Dew Point, % O2, Millivolts, Multi-loop, Vacuum, IR + Probe, Nitrider, % Carbon + Dual Temp, or Cascade.**

Temperature Mode:

This value determines the specific temperature scale to be used. It can be either Degrees °F or degrees °C.

Atmosphere Instrument:

The option will allow the user to select the instrument that will serve as the atmosphere instrument. The options are: **Internal Loop 1 – Internal Loop 3, Instrument 1 – Instrument 25.**

Temperature Instrument:

Allows for a slave instrument (or internal) to be the defined temperature control device. The types of instruments are: **Internal Loop 1 – Internal Loop 3, Instrument 1 – Instrument 25.**

Event Instrument:

Allows for a slave instrument (or internal) to be the defined event control device. The types of instruments are: **Internal, Instrument 1 – Instrument 25.**

Quench Instrument:

Allows for slave instrument (or internal) to be the defined quench control device. The types of instruments are: **Internal Loop 1 – Internal Loop 3, Instrument 1 – Instrument 25.**

End of Quench Event:

Tells the programmer which event to signal end of quench (related to which relay it is assigned). The list of possible values is: **0 – 14.**

Quench Speed Event:

Tells the programmer which event will signal the quench speed. The list of possible values is: **0 – 14.**

Quench Run Event:

Tells the programmer which event will signal quench run. The list of possible values is: **0 – 14.**

Televac on RS-232:

This value determines if there is a televac on the RS-232 port. The list of options are either **No** or **Yes.**

Date and Time:

Displays the current date and time.

PLC Type:

This value defines the type of PLC being used. The options are: **Micrologix Modbus, MCMmodule Modbus, DF1 PLC5, or DF1 Slik.**

Default Hold Time:

This value is the default holding time for the furnace. The range is **0** to **10000**.

Clear events/end of recipe:

This switch will allow the user to clear the events out at the end of a recipe. The options are either **no** or **yes**.

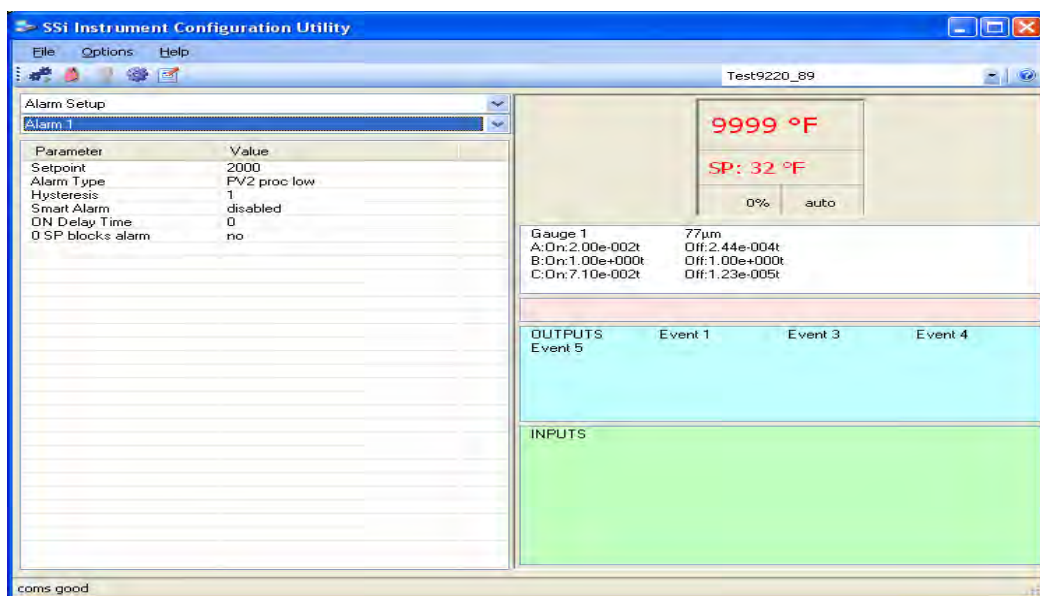
Default Wait Limits

*** This menu option is the same as the *Default Wait Limits* menu option under the *Configurator-9200 Drop Down Menu*. ***

Furnace Name

*** This menu option is the same as the *Furnace Name* menu option under the *Configurator-9200 Drop Down Menu*. ***

Alarm Setup



Configurator – Alarm Setup menu option

The 9220 controller can be configured to use three different alarms, and a Thermocouple Check. Each of the alarms consists of an alarm setpoint, alarm type, alarm hysteresis, smart alarm, ON delay time, and a 0 SP blocks alarm value. The alarms come from the factory with a default configuration dependent on the application but also can be modified prior to shipment to your facility or in the field by a supervisor.

Setpoint:

This value is the setpoint for the alarm. Clicking on this value will display an input box from which the user can select a new value. The range is from -9999.00 to 9999.00.

Alarm Type:

This value is the type of alarms used. Clicking on this value will display an input box with two (2) drop-down lists from which the user can select a new value.

The values in the first (top) list box are:

- PV 1 Value
- PV 2 Value
- PV 3 Value
- Input 1 Value
- Input 2 Value
- Input 3 Value
- PO1 Value
- PO2 Value
- PO3 Value

The values in the second (bottom) list box are:

- Process High
- Process Low
- Band, Normally Open
- Band, Normally Closed
- Deviation, Normally Open
- Deviation, Normally Closed

Hysteresis:

This value is the Hysteresis value. Clicking on this value will display an input box from which the user can select a new value. The range is from **0** to **9999**.

Smart Alarm:

This value is a display of the Smart Alarm status. The value can be either **disabled** or **enabled**.

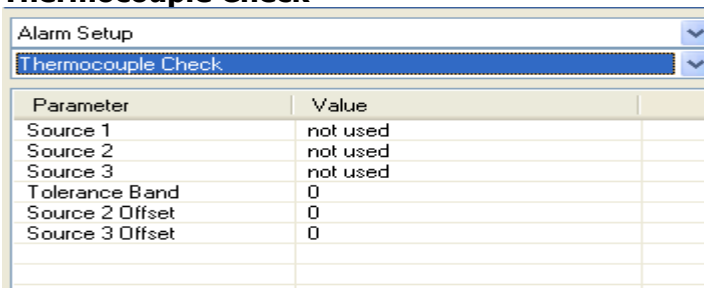
ON Delay Time:

This value is the ON Delay Time. Clicking on this value will display an input box from which the user can select a new value. The range is from **0** to **9999**.

0 SP Blocks Alarm:

This value will allow a 0 setpoint to block an alarm. The options are either **no** or **yes**.

Thermocouple Check



Parameter	Value
Source 1	not used
Source 2	not used
Source 3	not used
Tolerance Band	0
Source 2 Offset	0
Source 3 Offset	0

Configurator – Alarm Setup Thermocouple Check menu option

Source 1 – Source 3:

These are the values for the first, second, and third source. The options are: **not used**,

Instrument 1 – Instrument 27, n/a, or **Input 3 – Input 1**.

Tolerance Band:

This is the tolerance band for the thermocouple. The range is **–9999** to **9999**.

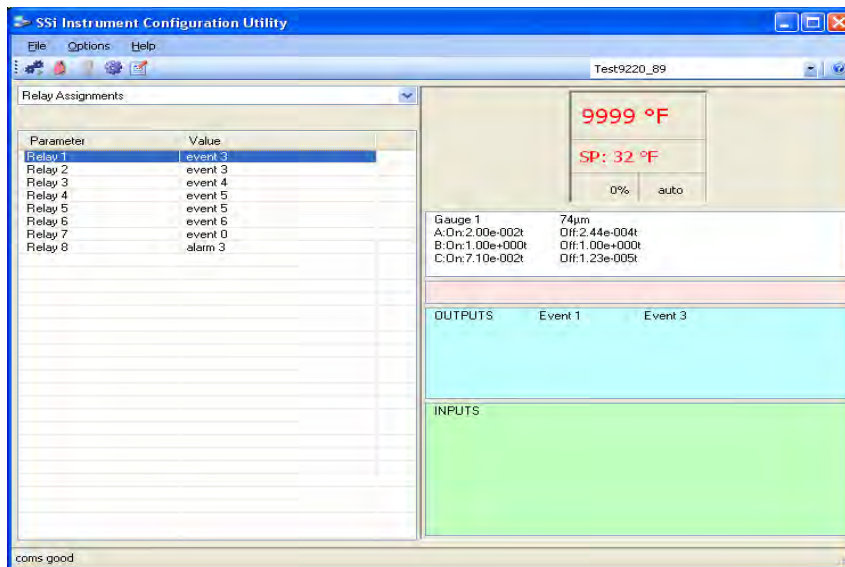
Source 2 Offset:

This is the offset for source 2. The range is **–9999** to **9999**.

Source 3 Offset:

This is the offset for source 3. The range is **–9999** to **9999**.

Relay Assignments



Configurator – Relay Assignments menu option

The 9220 controller has the option of using eight relay outputs. All of the relays have a positive common terminal and independent negative terminals. All of the relays are configured in a normally closed position except relay number eight, which has both a normally closed (NC) and a normally open (NO) terminal.

Relay Output Terminals:

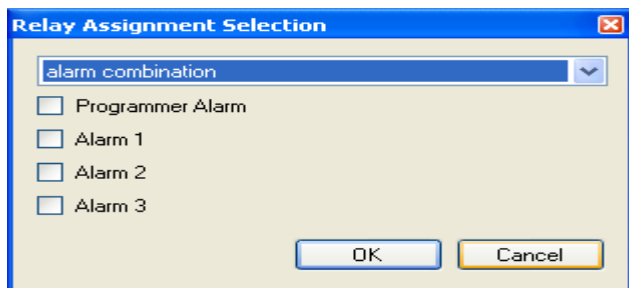
- Relay Output 1 – terminals 7 and 8
- Relay Output 2 – terminals 7 and 9
- Relay Output 3 – terminals 7 and 10
- Relay Output 4 – terminals 7 and 11
- Relay Output 5 – terminals 7 and 12
- Relay Output 6 – terminals 7 and 13
- Relay Output 7 – terminals 7 and 14
- Relay Output 8 – terminals 7 and 15 NC
- Relay Output 8 – terminals 7 and 16 NO

Relay Output Choices:

- | | | |
|-----------|--------------|----------|
| Loop1 fwd | Event 15 | event 27 |
| Loop1 rev | Out gas hold | event 28 |

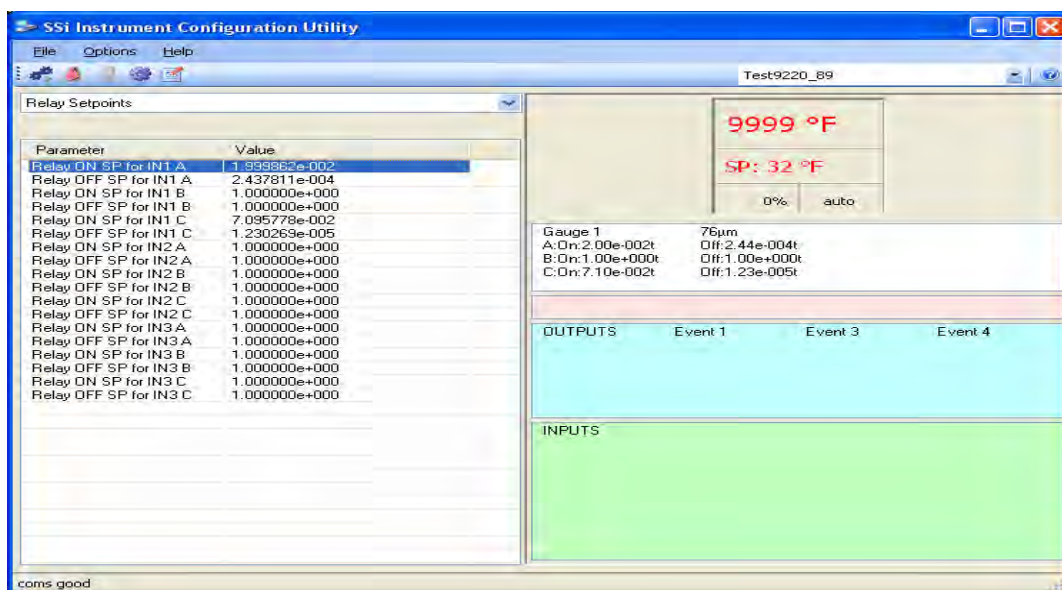
Loop2 fwd	Gauge 1 relay SP A	event 29
Loop2 rev	Gauge 1 relay SP B	event 30
Loop3 fwd	Gauge 1 relay SP C	event 31
Loop3 rev	Gauge 2 relay SP A	event 32
Programmer Alarm	Gauge 2 relay SP B	event 33
Alarm 1	Gauge 2 relay SP C	event 34
Alarm 2	Gauge 3 relay SP A	event 35
Alarm 3	Gauge 3 relay SP B	event 36
Event 0	Gauge 3 relay SP C	event 37
Event 1	Gauge 4 relay SP A	event 38
Event 2	Gauge 4 relay SP B	event 39
Event 3	Gauge 4 relay SP C	event 40
Event 4	event 16	event 41
Event 5	event 17	event 42
Event 6	event 18	event 43
Event 7	event 19	event 44
Event 8	event 20	event 45
Event 9	event 21	event 46
Event 10	event 22	event 47
Event 11	event 23	alarm combination
Event 12	event 24	N/A
Event 13	event 25	
Event 14	event 26	

The "Alarm Combination" option will allow the user to select the specific combination of alarms to use.



Configurator – Alarm Combination options

Relay Setpoints

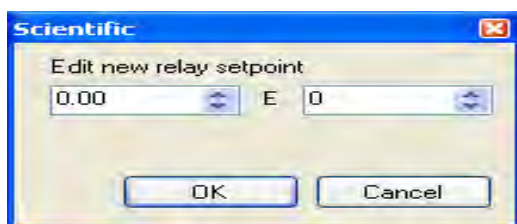


Configurator – Relay Setpoints menu option

This option is typically used for vacuum applications.

The 9220 controller offers the user three pairs of configurable vacuum setpoints for each input. Each pair of setpoints allows the user to configure both **ON** and **OFF** trigger points. The values entered are in scientific units based on input configuration.

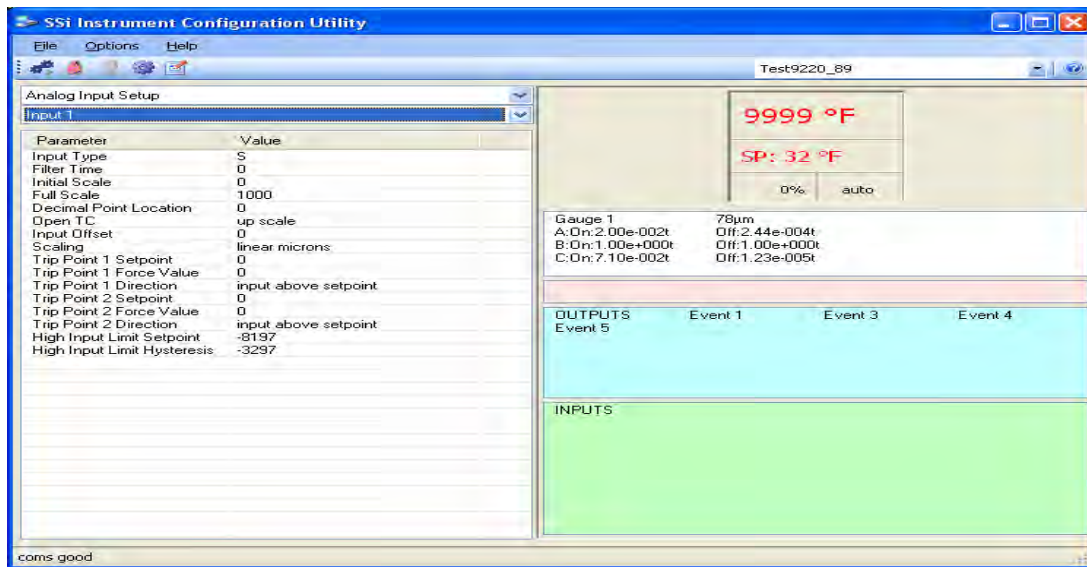
The relay setpoints can only be used once the relays are assigned as such in the *Relay Assignments* menu option.



Configurator – Edit Relay Setpoint screen

The left box has a range of **-10.00** to **10.00**, and the right box has a range of **-31** to **31**.

Analog Input Setup



Configurator – Analog Input Setup menu option

The 9220 controller has three analog inputs. Each of the inputs comes with a factory default configuration dependent on the application. It can be modified prior to shipment to your facility or in the field by a technician or qualified/trained person with the proper security code.

Analog Input Terminals

Analog Input 1 – terminals 31 and 32

Analog Input 2 – terminals 29 and 30

Analog Input 3 – terminals 27 and 28

Input Type:

The thermocouple type for most applications can be modified depending on your specific needs. Please note that in some applications, some of the inputs DO NOT allow the user to modify the Input type. To change the Input type, first select which input you want to change by selecting it in the pull-down menu just below the main menu list. Clicking on the Value will display an input box, and then you can use the pull-down menu to select the desired parameter. Once selected, click *OK* and the displayed Input type under Value will be the current type. The following is a list of the options:

B	S	12.5 volts
C	T	781.25mv
E	2.5 volts	195.3125 mV
J	1.25 volts	
K	78.125 mV	
N	19.53125 mV	
NNM	4-20 mA	
R	25 volts	

Filter time:

The filter time is a factory applied averaging tool used to help maintain steady control in high EMI environments. The filter time should not be adjusted with consulting SSI. Clicking on this value will display an input box from which the user can select a new value. The range is **0** to **32767**.

Initial Scale:

This is the initial scale value. Clicking on this value will display an input box from which the user can select a new value. The range is **-32768** to **32767**.

Full scale:

This is the full scale value. Clicking on this value will display an input box from which the user can select a new value. The range is **-32768** to **32767**.

Decimal Point Location:

This is the decimal point location value. Clicking on this value will display an input box from which the user can select a new value. The range is **0** to **4**.

Open TC:

This is the open TC value. Clicking on this value will toggle between **up scale**, **down scale**, **one trip point**, and **two trip points**.

Input Offset:

The input offset value is algebraically added to the input value to adjust the input curve on read-out. The range is **-10** to **10**.

Trip Point 1 Setpoint:

This is the trip point 1 setpoint value. The range is **-32768** to **32768**.

Trip Point 1 Force Value:

This is the trip point 1 force value. The range is **-32768** to **32768**.

Trip Point 1 Direction:

This is the trip point 1 direction. The options are: **input above setpoint** or **input below setpoint**.

Trip Point 2 Setpoint:

This is the trip point 2 setpoint value. The range is **-32768** to **32768**.

Trip Point 2 Force Value:

This is the trip point 2 force value. The range is **-32768** to **32768**.

Trip Point 2 Direction:

This is the trip point 2 direction. The options are: **input above setpoint** or **input below setpoint**.

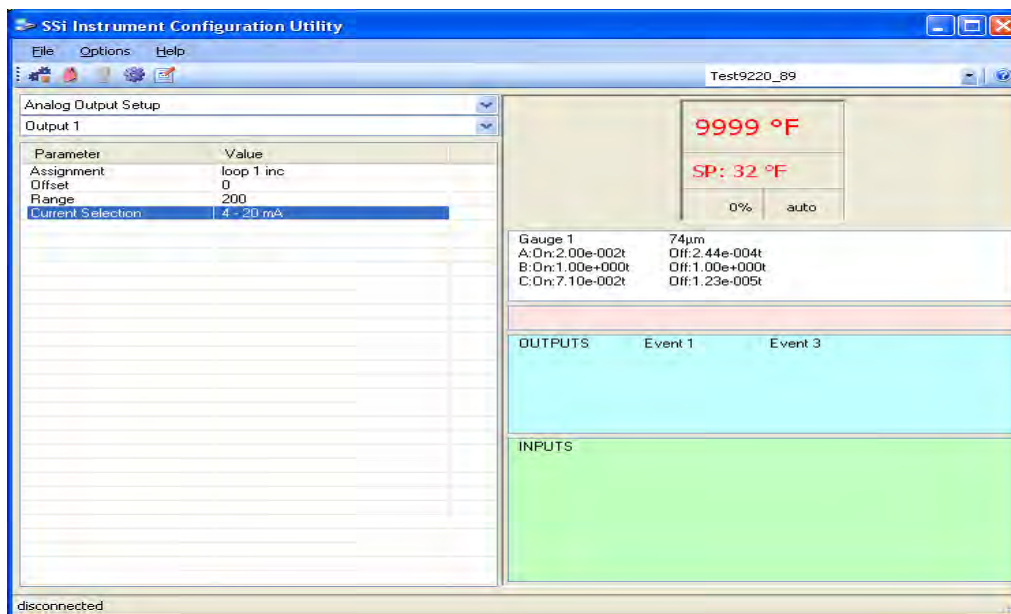
High Input Limit Setpoint:

This is the setpoint for the high input limit. The range is **-32768** to **32768**.

High Input Limit Hysteresis:

This is the setpoint for the high input limit. The range is **–32768** to **32768**.

Analog Output Setup



Configurator – Analog Output Setup menu option

The 9220 controller has the option of two analog outputs. The outputs are ranged for a 4 – 20 milliamp signal or a 0 – 20 milliamp signal. Each output comes with a factory default configuration dependent on the application. Each output can be modified prior to shipment to your facility or in the field by a supervisor.

Analog Output Terminals:

Analog output 1 – terminals 24 and 25

Analog output 2 – terminals 25 and 26

Assignment:

The analog output assignment can be modified depending on your system requirements. To change the Assignment first select which analog output you want to change by selecting it in the pull-down menu just below the main menu list. Clicking on this value will display an input box, and then you can use the pull-down menu to select the desired parameter. Once selected click **OK** and the displayed assignment under Value will be the current assignment type. The following is a list of the options:

PV 1 retrans	PV3 retrans	G1 linear torr	G4 log of torr
Loop 1 inc	Loop 3 inc	G1 microns	G4 linear torr
Loop 1 dec	Loop 3 dec	G2 log of torr	G4 microns
Loop 1 combo	Loop 3 combo	G2 linear torr	Programmer ID num
PV 2 retrans	Input 1 retrans	G2 microns	
Loop 2 inc	Input 2 retrans	G3 log of torr	
Loop 2 dec	Input 3 retrans	G3 linear torr	
Loop 2 combo	G1 log of torr	G3 microns	

Combo example for carbon – 4 – 12 mA Air
12 – 20 mA Gas

Offset:

This is the starting point, the Process Variable value at which you get 4 milliamps. Clicking on this value will display an input box from which the user can select a new value. The range is – **32768** to **32767**.

Range:

This is a Process Variable value between 4 and 20 milliamps. Clicking on this value will display an input box from which the user can select a new value. The range is –**32768** to **32767**.

Current Selection:

Provides the option of **4-20 mA** or **0-20 mA** control. Clicking on this value will display an input box with a drop-down list from which the user can select either of the two values listed above.

Offset and Range when assigned to a control loop:

Inc -- 0 = 4mA, 100 = 20mA

Dec -- 0 = 4mA, -100 = 20mA

Example: if 4 – 20 mA = 800 mV - 1200 mV

Offset = 800 (starting point)

Range = 400

Passcode and Alarm

*** This menu option is the same as the *Passcodes and Alarm* menu option under the *Configurator-9200 Drop Down Menu*. ***

IP Address

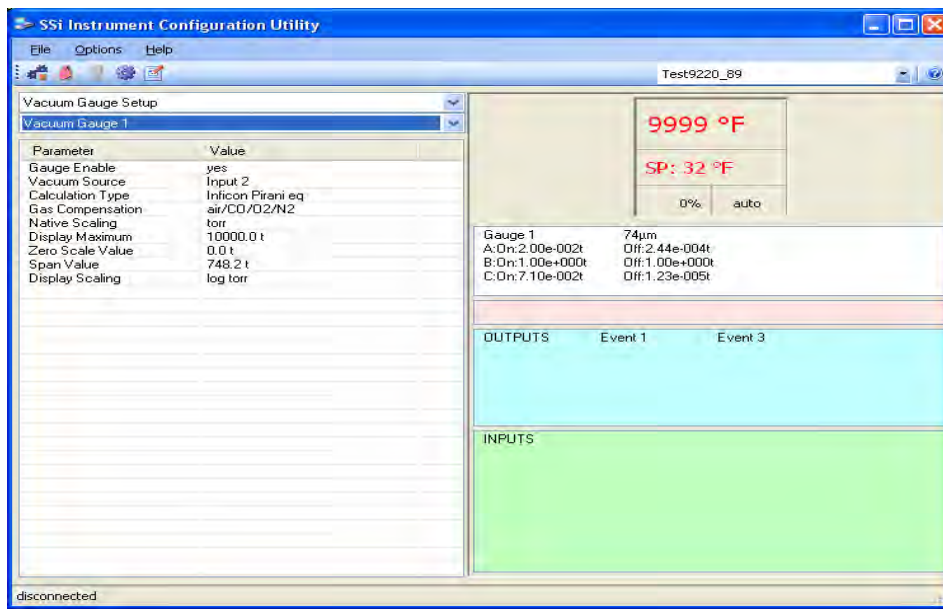
*** This menu option is the same as the *IP Address* menu option under the *Configurator-9200 Drop Down Menu*. ***

Event Control

*** This menu option is the same as the *Event Control* menu option under the *Configurator-9200 Drop Down Menu*. ***

Vacuum Gauge Setup

The Vacuum Gauge Setup menu option allows the users the ability to set up four different vacuum gauges. The vacuum gauge can be selected from the lower drop-down list.



Configurator – Vacuum Gauge Setup menu option

Gauge Enable:

This value will enable or disable the selected gauge. The options are either **No** or **Yes**.

Vacuum Source:

This value will allow the user to select the source of the gauge. The options are: **Input 1 – Input 3, Televac Gauge 1 – Televac Gauge 4**.

Calculation Type:

This value will allow the user to select the calculation type of the gauge. The options are: **none, linear log, or Inficon Pirani eq**.

Gas Compensation:

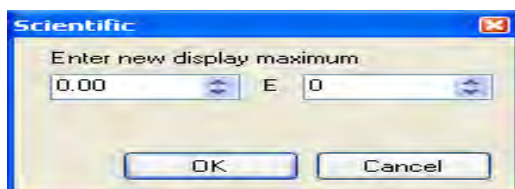
This value will allow the user to select the type of gas compensation for the gauge. The options are: **air/CO/O2/N2, Helium, Neon, Argon, Krypton, Xeon, H2, CO2, Water Vapor, or freon 12**.

Native Scaling:

This value will set the native scaling for the gauge. The options are: **torr, microns, millibars, bars, pascals, kilopascals, or log of torr**.

Display Maximum:

This value will set the maximum display value for the gauge. Clicking on this value will display an input box for the user to set the new maximum.



Configurator – Enter New Display Maximum screen

The left number box has a range of **–10.00** to **10.00**, and the right number box has a range of **–31** to **31**.

Zero Scale Value:

This value will set the zero scale value for the gauge. Clicking on this value will display an input box for the user to enter the zero scale value that is identical to the input box from the “Display Maximum” menu description.

Span Value:

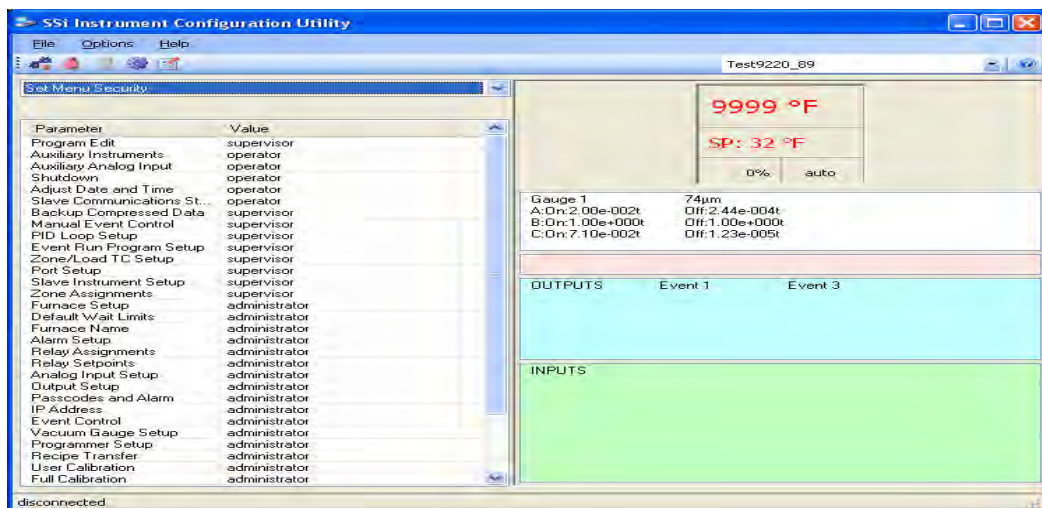
This value will set the span value for the gauge. Clicking on this value will display an input box for the user to enter the span value that is identical to the input box from the “Display Maximum” menu description.

Display Scaling:

This value will set the scaling for the display. The list of options is: **log torr**, **torr**, **microns**, **millibars**, or **pascals**.

Set Menu Security

The Set Menu Security menu option is a feature that is used to limit access to certain menu options and parameters that are vital to successful operation and



communication of your instrument. This page comes pre-configured by Super Systems Inc. and should not be adjusted without consulting SSI. The options are **operator**, **supervisor**, or **administrator**.

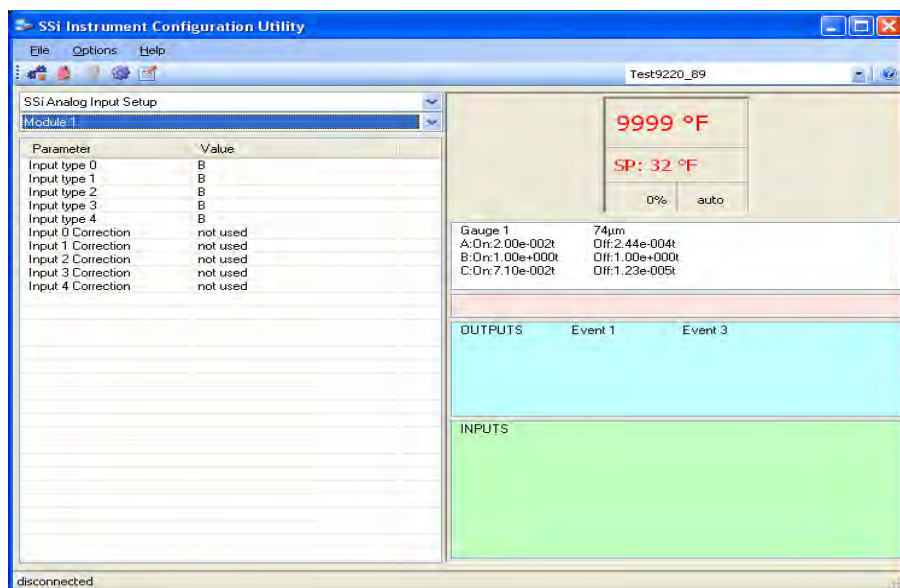
Custom Curves

*** This menu option is the same as the *Curve Entry* menu option under the *Configurator-9200 Drop Down Menu*. ***

Alternate PID Setup

*** This menu option is the same as the *Alternate PID Setup* menu option under the *Configurator-9200 Drop Down Menu*. ***

SSi Analog Input Setup



The SSI Analog Input Setup menu option allows the user an input selection of five inputs per module and five input corrections per module. There are eight modules available. It is configurable for voltage of T/C (universal input), and it is typically used for Load T/Cs and Auxiliary Flow Meters. Clicking on any of the values will display an input box from which the user

can select the input type from a drop-down list with the following values:

B	NNM	160 mV
C	R	80 mV
E	S	40 mV
J	T	20 mV
K	2.5 volts	4-20 mA/124Ω
N	1.25 volts	4-20 mA/62Ω

The options for the input corrections are: **not used**, **Curve 1** – **Curve 3**.

SSi Configuration and Calibration

*** This menu option is the same as the *SSi Configuration and Calibration* menu option under the *Configurator-9200 Drop Down Menu*. ***

The list of screens from the User Calibration section and the Full Calibration section is listed below in sequential order. Screen only found in the Full Calibration section are displayed in *Italics*. Screens only found in the User Calibration section are displayed in **Bold**.

1. Cold Junction
2. *Zero/Span Input 0/Range 0*
3. *Zero/Span Input 0/Range 1*
4. *Zero/Span Input 0/Range 2*
5. *Zero/Span Input 0/Range 3*
6. *Zero/Span Input 1/Range 0*
7. *Zero/Span Input 1/Range 1*
8. *Zero/Span Input 1/Range 2*
9. *Zero/Span Input 1/Range 3*
10. *Zero/Span Input 2/Range 0*
11. *Zero/Span Input 2/Range 1*
12. *Zero/Span Input 2/Range 2*
13. *Zero/Span Input 2/Range 3*

14. Zero/Span Input 3/Range 1

15. Zero/Span Input 1 Range Jumper

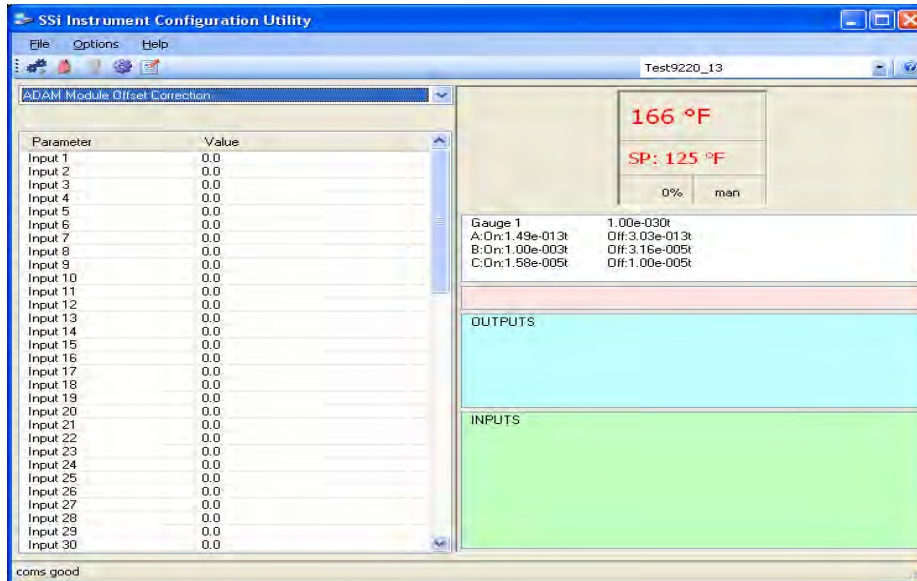
16. Zero/Span Input 2 Range Jumper

17. Zero/Span Input 3 Range Jumper

18. Zero/Span Output 1

19. Zero/Span Output 2

ADAM Module Offset Correction



The ADAM module Offset Correction menu option gives the user the ability to offset any input (1 – 40) on any ADAM module, as well as the Input correction offset (0 – 39). The offset can be in degrees + or -, and it is typically used to compensate for incorrect T/C wires. Clicking on any of the values will display an input box from which the user can select a

new offset. The range for the inputs is **-50 to 50**. The options for the corrections are: **not used, curve 1 – curve 3**.

Aux Setpoint Configuration

*** This menu option is the same as the *Aux Setpoint Configuration* menu option under the *Configurator-9200 Drop Down Menu*. ***

TC Extension Correction Curves

*** This menu option is the same as the *TC Extension Correction Curves* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Tuning Assistant

*** This menu option is the same as the *Tuning Assistant* menu option under the *Configurator-9200 Drop-Down Menu*. ***

Appendix A – Quench Control & Events

The quench opcode starts a timer that is independent of any program running. Therefore, another program can be started while the quench is timing. When a load is transferred to quench manually by an operator, the program will have an end of cycle alarm that will alert the operator to transfer the load. When the operator acknowledges the alarm, the next step in the program will be the quench opcode. For automatic (PLC) applications, an end of cycle event output would be followed by an event input, which could be the inner door or other contact indicating the load was transferred. The next step is the quench opcode. The end of quench event is a one-second momentary output. Two or three events are used by the quench opcode. Quench speed hi/lo, which is specified in the option, and end of quench - the one-second pulse at the end of quench time - are always used. A quench run event that is active while the quench timer is running can be assigned.

If the 9200 is also used for the quench temperature controller, the PVT type must be set to %C dual temperature. This uses input 1 for probe millivolts, input 2 for furnace temperature (also used for %C calculation), and input 3 for the quench temperature. Loop 1 is %C, loop 2 is furnace temperature, and loop 3 is quench temperature. The programmer would then have loop 3 assigned as the quench instrument

Appendix B – Opcodes

See the section *Notes About Opcodes* for any opcode-specific or general notes.

Control Group

Value	Opcode	Description	Temperature	Atmosphere	Option
0	NO-OP	No operation	N/A	N/A	N/A
1	BRANCH	Branch to step	True step number	False step number	N/A
2	GOSUB	Go to subroutine	N/A	N/A	Program number
3	JUMP	Jump to program	N/A	N/A	Program number
4	LIMIT	Time limit on wait	N/A	N/A	Time in hours:minutes
5	PIDLOAD	Load PID set	Loop 1 set	Loop 2 set	Loop 3 set
6	RESET	Reset values and start program	Program number	Step number	N/A
7	SET_FACT	Set factor	N/A	CO or H Factor	Wait, Wait Up, Wait Down
8	SET_WAIT	Set wait limits	Temperature value	N/A	N/A
9	RUN_SLAVE	Start a recipe in a slave instrument	Program number	Step number	Instrument number

Alarm Group

Value	Opcode	Description	Temperature	Atmosphere	Option
20	ALARM	User Alarm	N/A	N/A	Alarm number (1 – 100)
21	DEV_AL	Deviation Alarm	N/A	N/A	Off, temperature
22	HIGH_AL	High limit alarm	Temperature value	N/A	N/A
23	HIGH_PO	High percent output alarm	Temp PO value (-200)	N/A	N/A
24	LOW_AL	Low limit alarm	Temperature value	N/A	N/A
25	LOW_PO	Low percent output alarm	Temp PO value (-200)	N/A	N/A

Events Group

Value	Opcode	Description	Temperature	Atmosphere	Option
40	EVT IN	Wait for input event	Temperature setpoint	N/A	Event number OFF/ON (2 * # + 0 or 1)
41	EVT OUT	Event output	Temperature setpoint	N/A	Event number OFF/ON (2 * # + 0 or 1)
42	MEVT OUT 0	Multiple event output 0	Temperature setpoint	Event mask (bit map)	Event number OFF/ON bit map
43	MEVT OUT 1	Multiple event output 1	Temperature setpoint	Event mask (bit map)	Event number OFF/ON bit map

44	MEVT OUT 2	Multiple event output 2	Temperature setpoint	Event mask (bit map)	Event number OFF/ON bit map
45	MEVT IN 0	Multiple event input 0	Temperature setpoint	Event mask (bit map)	Event number OFF/ON bit map
46	MEVT IN 1	Multiple event input 1	Temperature setpoint	Event mask (bit map)	Event number OFF/ON bit map

Identity Group

Value	Opcode	Description	Temperature	Atmosphere	Option
50	ID_SET	Set ID number	ID number value	N/A	N/A
51	ID_INC	Increment ID number	N/A	N/A	N/A
52	ID_INQ	ID number inquiry	ID number value	N/A	Equal,high, low

Temperature Group

Value	Opcode	Description	Temperature	Atmosphere	Option
60	GRAMP	Guaranteed ramp (temperature)	Temperature setpoint	N/A	Ramp time in hours:minutes
61	PO_INQ	Test percent output	Temp PO value (-200)	N/A	Wait, wait up, wait down
62	QUENCH	Start quench cycle	Quench temperature	Quench time (minutes)	Speed low, speed high
63	RAMP	Ramp setpoints	Temperature setpoint	N/A	Ramp time in hours:minutes
64	RAMPR	Ramp at rate	Temperature setpoint	N/A	Ramp time in degrees per minute
65	SETPT	Setpoint	Temperature setpoint	Loop or instrument	None, wait, wait up, wait down
66	TC_INQ	Temperature inquiry	Temperature level	N/A	Wait, wait up, wait down
67	ZONE_OFF	Set offset zone	Temperature offset	N/A	Zone number 0 to 4 (display 1 to 5)
68	QTCset	Quench temperature setpoint	Temperature setpoint	N/A	N/A
69	SET_AUX	Set aux instrument setpoint	Setpoint value	N/A	Instrument number
70	TZ_INQ	Temperature zone inquiry	Temperature level	N/A	Wait, wait up, wait down
71	GZRAMP	Guaranteed ramp (TC zone)	Temperature setpoint	N/A	Ramp time in hours:minutes
72	Z_SETPT	Setpoint, TC zone	Temperature setpoint	Loop or instrument	None, wait, wait up, wait down

Time Group

Value	Opcode	Description	Temperature	Atmosphere	Option
80	SOAK	Soak	N/A	N/A	Soak time in hours:minutes

81	DELAY	Short delay	N/A	N/A	Delay time in seconds
82	DOW_INQ	Day of week inquiry	N/A	N/A	SUN, MON, TUE, WED, THU, FRI, SAT
83	G_SOAK	Guaranteed soak (temperature)	N/A	Max hold time	Soak time in hours:minutes
84	GHSOAK	GSOAK, high limit only	N/A	Max hold time	Soak time in hours:minutes
85	GLSOAK	GSOAK, low limit only	N/A	Max hold time	Soak time in hours:minutes
86	TOD_INQ	Time of day inquiry	N/A	N/A	Time in 24 hour form (hours:minutes)
87	GTCINQDEL	Guaranteed TC inquiry delay	Delay time	Control TC or load TCs	Wait, wait up, wait down
88	GZ_SOAK	Guaranteed soak (TC zone)	N/A	Max hold time	Soak time in hours:minutes
89	GHZSOAK	GSOAK, high limit only, zone	N/A	Max hold time	Soak time in hours:minutes
90	GLZSOAK	GSOAK, low limit only, zone	N/A	Max hold time	Soak time in hours:minutes

Vacuum Group

Value	Opcode	Description	Temperature	Atmosphere	Option
100	RLY_INQ	Relay state inquiry	Off step	On step	Gage/ABC
101	RLY_SP_M	Relay setpoint in Micron	ON setpoint in Micron	OFF setpoint in Micron	Gage/ABC
102	RLY_SP_T	Relay setpoint in Torr	ON setpoint in Torr	OFF setpoint in Torr	Gage/ABC
103	VAC_INQ_M_1	Vac inquiry in Micron gage 1	N/A	Micron level	Wait, wait up, wait down
104	VAC_INQ_M_2	Vac inquiry in Micron gage 2	N/A	Micron level	Wait, wait up, wait down
105	VAC_INQ_M_3	Vac inquiry in Micron gage 3	N/A	Micron level	Wait, wait up, wait down
106	VAC_INQ_M_4	Vac inquiry in Micron gage 4	N/A	Micron level	Wait, wait up, wait down
107	VAC_INQ_T_1	Vac inquiry in Torr gage 1	N/A	Torr level	Wait, wait up, wait down
108	VAC_INQ_T_2	Vac inquiry in Torr gage 2	N/A	Torr level	Wait, wait up, wait down
109	VAC_INQ_T_3	Vac inquiry in Torr gage 3	N/A	Torr level	Wait, wait up, wait down
110	VAC_INQ_T_4	Vac inquiry in Torr gage 4	N/A	Torr level	Wait, wait up, wait down

SPP2 Group

Value	Opcode	Description	Temperature	Atmosphere	Option
-------	--------	-------------	-------------	------------	--------

120	ATM_INQ	% Carbon Inquiry	N/A	Atmosphere level	Wait, Wait Up, Wait Down
121	MV_INQ	Millivolt Inquiry	N/A	Millivolt level	Wait, Wait Up, Wait Down
122	PIDLOAD	Load PID Set	Loop 2 Set	Loop 1 Set	Loop 3 Set
123	SETVALVE	Set valve setpoint	Setpoint	Trim range	Valve number (0-3)
124	SETBP (SETLP3)	Set back pressure (loop 3) setpoint	Setpoint	N/A	N/A
125	SETFCM	Set flow control mode (Nitrider)	N/A	N/A	Control mode
126	IN_INQ	Input inquiry	Input value	Which Input	Wait, Wait Up, Wait Down
127	CC_SP_L	Set setpoint limits for cascade	SP lower limit	SP upper limit	N/A
128	TC_CHK	Activate or deactivate TC check	Source 1	Source 2	Source 3
129	SET_SL_VAL	Set slave value	Data value	Register number	Instrument number
130	PLC_SET_VAL	PLC set value	Data value	Register number	None, Wait, Wait Up, Wait Down
131	OGholdm	Out gas hold micron	N/A	Micron level	Gage; 0 turns off else gage 1,2,3, or 4
132	Ogholdt	Out gas hold torr	N/A	Torr level	Gage; 0 turns off else gage 1,2,3, or 4
133	VLUP_ch	Vacuum leak up check	Test pass step	Test retry step	Test fail step

Notes About Opcodes

1. A Temperature column value of **-301** disables the temperature data.
2. A vacuum column value of **-1** disables the vacuum data column for non-vacuum opcodes.
3. Temperature PO (percent output) values for HIGH_PO, LOW_PO, and PO_INQ are offset by a value of **-200**, i.e., **-300** to **-100** represents **-100** to **100**.
4. Atmosphere PO (percent output) values for HIGH_PO, LOW_PO, and PO_INQ are offset by a value of **+100**, i.e., **0** to **200** represents **-100** to **100**.
5. Wait is until in band, Wait up and Wait down are until value is reached +/- **1**.
6. GRAMP is the same as RAMP, except that the temperature must be in band for GRAMP.
7. Load TCs can hold RAMP if they are enabled.
8. GSOAK is the same as SOAK, except that the temperature must be in band for GSOAK.
9. RAMPR uses a rate specification instead of time. This applies only to temperature.
10. GLSOAK is the same as GSOAK, except that only the low band limit applies, i.e., $PV > SP - \text{limit}$.
11. GHSOAK is the same as GSOAK, except that only the high band limit applies, i.e., $PV < SP + \text{limit}$.
12. The Max hold time in the vacuum column overrides the default max hold time for the current step only.
13. The multiple event opcodes use a bit map mask to identify what events are addressed, and a bit for the OFF/ON state of those events.

14. The TC zone inquiry checks all of the instruments defined in the temperature zone mapping and waits for all instruments to satisfy the given condition.
15. The RUN SLAVE opcode only applies to SSi programmers.
16. GZ_SOAK, GLZSOAK, GHZSOAK, GZRAMP, Z_SETPT, and TZ_INQ operate the same as the opcodes without the "Z" (i.e., G_SOAK, GLSOAK, etc.), except that *all* instruments defined in the temperature zone assignments must meet the required condition.
17. PLC_SET_VAL sets the specified register number in the PLC write table. If the option is set, then the wait applies to the corresponding register in the PLC read table. PLC register numbers from 100 to 199 apply to the optional second write table as 0 to 99. The option values are ignored when referencing the second write table.

BRANCH and LIMIT opcodes

The BRANCH and LIMIT opcodes perform special functions for the opcodes that precede them in a program. The following is a list of the opcodes that can use the BRANCH and/or LIMIT opcode.

Opcode	Description
EVT IN	Wait for an input event
MEVT IN x	Wait for an input event
EVT OUT	Event output
MEVT OUT x	Event output
ID_INQ	ID number inquiry
PO_INQ	Test percent output
SETPT	Setpoint
TC_INQ	Temperature inquiry
TZINQ	Temperature inquiry
DOW_INQ	Day of week inquiry
TOD_INQ	Time of day inquiry
VAC_INQ_M_1	Vac inquiry in Micron gage 1
VAC_INQ_M_2	Vac inquiry in Micron gage 2
VAC_INQ_M_3	Vac inquiry in Micron gage 3
VAC_INQ_M_4	Vac inquiry in Micron gage 4
VAC_INQ_T_1	Vac inquiry in Torr gage 1
VAC_INQ_T_2	Vac inquiry in Torr gage 2
VAC_INQ_T_3	Vac inquiry in Torr gage 3
VAC_INQ_T_4	Vac inquiry in Torr gage 4

The BRANCH and LIMIT opcodes must always follow the opcode to which they apply, and if they are used together, the LIMIT opcode is placed before the BRANCH. The LIMIT opcode sets a maximum amount of time to wait for the given condition to become true. For example, a TC_INQ 1700 Wait up is followed by a BRANCH 13 7. If the TC_INQ is not satisfied, the recipe will go to step 7. If the TC_INQ is satisfied, then the recipe will go to step 13. The BRANCH opcode can be unconditional by setting the true and false steps to the same value, i.e., BRANCH 7 7.

The combination of a LIMIT and BRANCH opcodes puts a time delay in before the false step is taken. For example, a TC_INQ 1700 Wait up is followed by a LIMIT 1:30 and then a BRANCH 13 7. The TC_INQ would have to be satisfied for 1½ hours before the recipe would go to step

7. If the TC_INQ is not satisfied at any point during that 1½-hour period, then the recipe will go to step 13.

Appendix C - Programmer Alarms

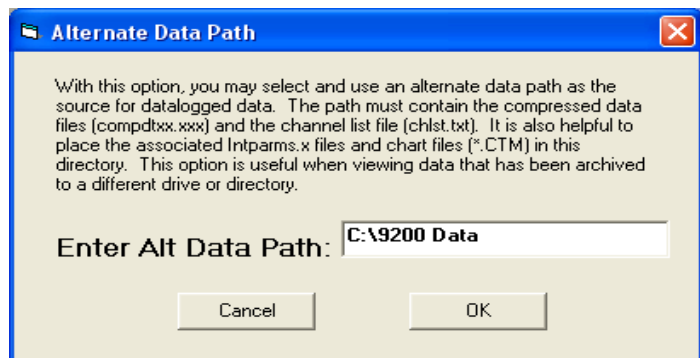
The programmer alarm provides the ability to trigger specific alarms when a program is running. They can be user defined alarms ranging from Programmer Alarm 1-99 or be specific alarms occurring during the program. User defined programmer alarms are entered using the User Alarm op-code in a recipe. A list of the process-related programmer alarms is listed below.

Alarm	Code
User Alarm	100
Atmosphere Deviation	101
High Atmosphere	102
Low Atmosphere	103
Temperature Deviation	104
High Temperature	105
Low Temperature	106
High Atmosphere % Output	107
Low Atmosphere % Output	108
High Temperature % Output	109
High Temperature % Output	110
Gosub Error	111
Limit Alarm	112
Recipe Hold Alarm	115
Bad PID Values	125

Appendix D - Flash Card Management

This appendix will show the user how to pull logged data from an Advantech screen and view it on the PC using a flash card reader and SD Recorder. This option requires SDRecorder to be installed on the local computer. If SDRecorder is not installed, see *Appendix E – SDRecorder Installation* for instructions on how to install the SDRecorder software. If SDRecorder is installed, continue on with these instructions.

1. Shut down the screen software. To shut down the screen software, press the **Menu** button from the Default Display Screen. This will display the *Configuration* menu list. Select the *Shutdown* menu option and confirm the shutdown process. See the section *Shutdown* in the *Chapter 2 – Configuration* section of this manual for more information on shutting down the screen software.
2. When the Windows desktop is visible, turn off the screen using the power switch located on the back of the screen just above the power connector.
3. Remove the compact flash card from the top rear of the screen. *Note – Be sure to remember the orientation of the compact flash card with respect to the screen. The compact flash card will only fit into the screen one way.*
4. Read the flash card with a compact flash card reader onto a PC. Copy the contents of the "\\SSi\\COMP\\" folder and the "\\SSi\\LOG\\" folder into a folder on the PC. *Note – The location of this folder can be anywhere on the PC, however, it is recommended that the user keep the location of this folder simple – i.e. directly on the main drive (C:). For example, the location "C:\\9200 Data\\" is better than "C:\\SSi\\Devices\\9200\\Data\\".*
5. It is also helpful to include the INTPARMS.x files, chlist.txt file, and any associated chart files (.CTM) into the selected folder. These files should be located on the installation CD. *Note: The default .ctm file for the instrument is located in the "Comp" folder.*
6. Open SD Recorder.
7. From the *Options* menu on SD Recorder, select *Alternate Data*. The user will have to enter the location of the alternate data, which is the location of the selected folder, i.e. "C:\\9200 Data".
8. Click the **OK** button to use the alternate data that was pulled off of the compact flash card.
9. Open the default chart for the instrument by clicking on the *Open* menu item from the *File* menu option.
10. If necessary, navigate to the alternate data folder, i.e., "C:\\9200 Data" and open the "Comp" folder. The default chart file will be in this folder. It will be named after the instrument, i.e., "9200Data.CTM" for a 9200 instrument. Now the data from the instrument will be available to view.



Appendix E - SDRecorder Installation

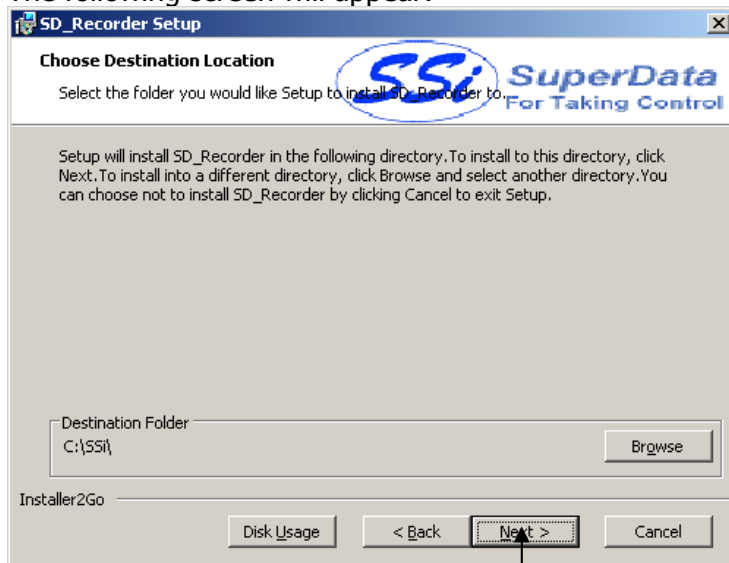
The SDRecorder Installation installs the SDRecorder program and associated files onto the PC. SDRecorder is used to allow the user to view and print data logged data in a chart or tabular format. To install the program follow the steps listed below:

1. From the Installation CD double-click on the SD_SDRecetup.exe file. The following screen will appear:



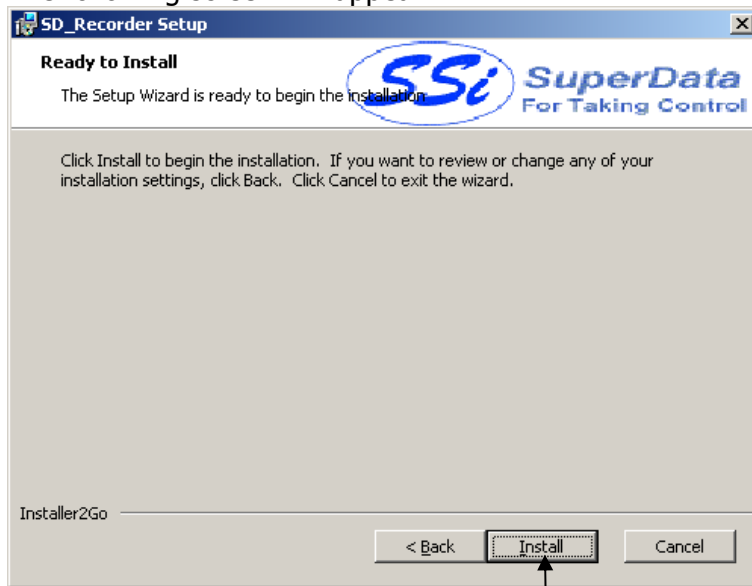
2. Click on the Next button.

The following screen will appear:



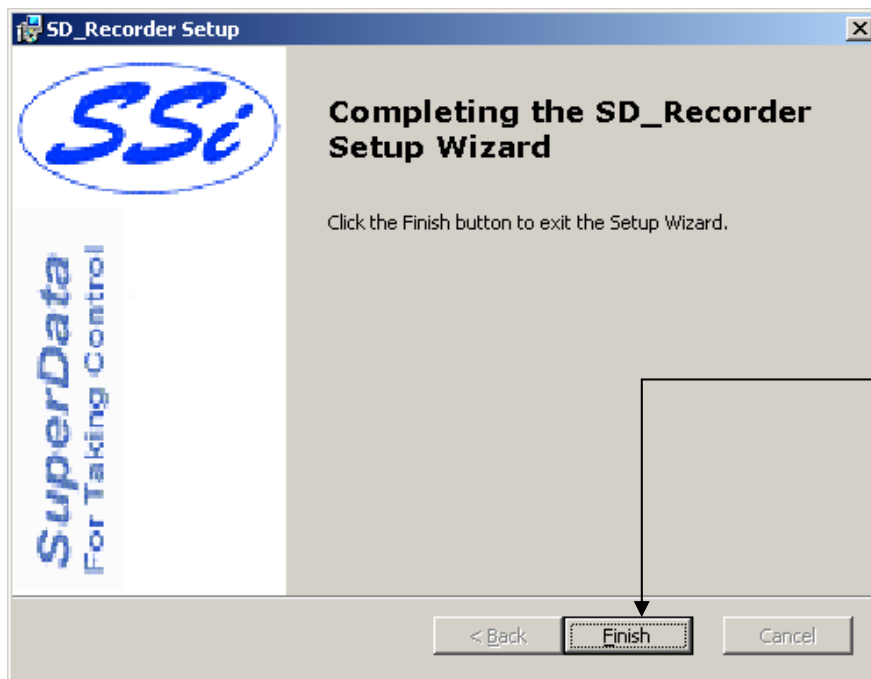
3. Click on the Next button.

The following screen will appear:



4. Click on the Install button.

5. Once the Program has finished being installed the following screen will appear. Click on the Finish button.



Appendix F – Slave Instrument Mapping

The following tables can be used as a reference for retrieving information such as the PV, setpoint, etc from a slave instrument. The slave instrument information will have a base offset based on the instrument number that is assigned. The base offset can be determined using the following formula:

$$\text{Base Offset} = (\text{Instrument Number} * 100) + 900$$

For example, the base offset for instrument 1 would be 1000 $\rightarrow (1 * 100) + 900$ – and the base offset for instrument 7 would be 1600 $\rightarrow (7 * 100) + 900$. The slave instruments will be split into three sections: Atmosphere Instruments, Temperature Instruments, and Events Instruments. The layout for each instrument will be the same:

- Controller – The type of controller the slave instrument is – i.e. AC20, Series 9200, etc.
- Source Location – The register *in the controller* where the specified value is located.
Note: These will be added on to the base offset of the instrument (see above section).
For example, the source location for %C actual for an AC20 is 11. For instrument 1, the register to find the %C actual would be 1011 \rightarrow the base offset for instrument 1 is 1000, plus the source location of 11.
- Write Register – The register *within the slave instrument* where the value will be written.
- Read Scale – Any value read in from an instrument will be divided by this number for display purposes only.
- Write Scale – Any value written to an instrument will be multiplied by this number for display purposes only.
- Description – This will be a brief description of what the value is, i.e. %C actual, Setpoint, etc.

Atmosphere Instruments

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
AC20	11	123	1	1	%C Actual
(Modbus Mode)	29	138	1	1	%C Setpoint
	13	125	1	1	Probe Temperature
	10	122	1	1	Probe Millivolts
	20	130	10	10	%C Percent Output
	34	142	1	1	CO Factor or Equivalent
	35	143	1	1	H Factor or Equivalent
	12	124	1	1	Dew Point
	36	144	10	10	O2

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Yoko 750	2	2	1	1	%C Actual
(Modbus Mode)	3	100	1	1	%C Setpoint
	20	19	1	1	Probe Temperature
	10	122	1	1	Probe Millivolts
	4	4	10	10	%C Percent Output
	0	0	1	1	CO Factor or Equivalent
	0	0	1	1	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
UDC 3300's	1	0	1	1	%C Actual
(Modbus Mode)	3	2	1	1	%C Setpoint
	6	5	10	10	Probe Temperature
	5	4	10	10	Probe Millivolts
	4	3	10	10	%C Percent Output
	43	39	10	10	CO Factor or Equivalent
	43	39	10	10	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Loop 1	21	20	1	1	%C Actual
(Modbus Mode)	7	6	1	1	%C Setpoint
	18	17	8	8	Probe Temperature
	19	18	8	8	Probe Millivolts
	41	40	41	41	%C Percent Output
	4	3	1	1	CO Factor or Equivalent
	5	4	1	1	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Loop 2	21	20	1	1	%C Actual
(Modbus Mode)	8	7	1	1	%C Setpoint
	18	17	8	8	Probe Temperature
	19	18	8	8	Probe Millivolts
	42	41	41	41	%C Percent Output
	4	3	1	1	CO Factor or Equivalent
	5	4	1	1	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Loop 1	20	20	1	1	%C Actual
(MMI Mode)	6	6	1	1	%C Setpoint
	17	17	8	8	Probe Temperature
	18	18	8	8	Probe Millivolts
	40	40	41	41	%C Percent Output
	3	3	1	1	CO Factor or Equivalent
	4	4	1	1	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Loop 2	20	20	1	1	%C Actual
(MMI Mode)	7	7	1	1	%C Setpoint
	17	17	8	8	Probe Temperature
	18	18	8	8	Probe Millivolts
	41	41	41	41	%C Percent Output
	3	3	1	1	CO Factor or Equivalent
	4	4	1	1	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Eurotherm 2404	1	1	1	1	%C Actual
(Modbus Mode)	5	5	1	1	%C Setpoint
	72	11073	1	1	Probe Temperature
	61	11062	1	1	Probe Millivolts
	4	4	1	1	%C Percent Output
	0	0	1	1	CO Factor or Equivalent
	0	0	1	1	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Eurotherm 2500	1	1	1	1	%C Actual
(Modbus Mode)	5	5	1	1	%C Setpoint
	72	11073	1	1	Probe Temperature
<i>Assumes Loop 1 =</i>	61	11062	1	1	Probe Millivolts
<i>Atmosphere</i>	4	4	1	1	%C Percent Output
	68	11069	1	1	CO Factor or Equivalent
	68	11069	1	1	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Carbpro 3.5	6	28	1	1	%C Actual
(MMI Mode)	1	1	1	1	%C Setpoint
	5	25	8	8	Probe Temperature
	4	24	8	8	Probe Millivolts
	11	117	1	1	%C Percent Output
	13	7	1	1	CO Factor or Equivalent
	14	8	1	1	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Carbpro 3.0	6	28	4	4	%C Actual
(MMI Mode)	1	1	1	1	%C Setpoint
	5	25	8	8	Probe Temperature
	4	24	2	2	Probe Millivolts
	11	117	1	1	%C Percent Output
	13	7	1	1	CO Factor or Equivalent
	14	8	1	1	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Carbpc	20	20	1	1	%C Actual
(MMI Mode)	6	6	1	1	%C Setpoint
	17	17	8	8	Probe Temperature
	18	18	8	8	Probe Millivolts
	64	64	41	41	%C Percent Output
	3	3	1	1	CO Factor or Equivalent
	4	4	1	1	H Factor or Equivalent

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Series 9200 Loop 1	3	126	1	1	%C Actual
	5	128	1	1	%C Setpoint
	22	145	1	1	Probe Temperature
	21	144	10	10	Probe Millivolts
	7	130	10	10	%C Percent Output
	19	142	1	1	CO Factor or Equivalent
	20	143	1	1	H Factor or Equivalent

Temperature Instruments

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Series 20	11	123	1	1	Temperature Controller Actual
(Modbus Mode)	30	138	1	1	Temperature Controller Setpoint
	18	130	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Yoko 750	2	2	1	1	Temperature Controller Actual
(Modbus Mode)	3	100	1	1	Temperature Controller Setpoint
	4	4	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
UDC 3300's	1	0	10	10	Temperature Controller Actual
(Modbus Mode)	3	2	10	10	Temperature Controller Setpoint
	4	3	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Loop 1	18	17	8	8	Temperature Controller Actual
(Modbus Mode)	7	6	1	1	Temperature Controller Setpoint
	41	40	41	41	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Loop 2	18	17	8	8	Temperature Controller Actual
(Modbus Mode)	8	7	1	1	Temperature Controller Setpoint
	42	41	41	41	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Loop 1	17	17	8	8	Temperature Controller Actual
(MMI Mode)	6	6	1	1	Temperature Controller Setpoint
	40	40	41	41	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Loop 2	17	17	8	8	Temperature Controller Actual
(MMI Mode)	7	7	1	1	Temperature Controller Setpoint
	41	41	41	41	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Eurotherm 2404	1	1	1	1	Temperature Controller Actual
(Modbus Mode)	2	2	1	1	Temperature Controller Setpoint
	3	3	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Eurotherm 2500	26	1025	1	1	Temperature Controller Actual
(Modbus Mode)	27	1026	1	1	Temperature Controller Setpoint
<i>Assumes Loop 2 is Temperature</i>	29	1028	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Unipro 3.5	3	25	8	8	Temperature Controller Actual
(MMI Mode)	1	1	1	1	Temperature Controller Setpoint
	5	118	1	1	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Unipro 3.0	3	25	8	8	Temperature Controller Actual
(MMI Mode)	1	1	1	1	Temperature Controller Setpoint
	5	118	1	1	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Carbpro 3.5 Slave	9	46	1	1	Temperature Controller Actual
(MMI Mode)	3	18	1	1	Temperature Controller Setpoint
	12	53	41	41	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Carbpro 3.0 Slave	9	46	1	1	Temperature Controller Actual
(MMI Mode)	3	18	1	1	Temperature Controller Setpoint
	12	53	41	41	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
10Pro Slave or E Slave	2	2	1	1	Temperature Controller Actual
(MMI Mode)	3	3	1	1	Temperature Controller Setpoint
	4	4	1	1	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Input C	19	19	8	8	PV
	5	5	1	1	Setpoint Loop 1
	40	40	41	41	Percent Output Loop 1

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Series 9200 Loop 1	3	126	1	1	Temperature Controller Actual
	5	128	1	1	Temperature Controller Setpoint
	7	130	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Series 9200 Loop 2	8	131	1	1	Temperature Controller Actual
	10	133	1	1	Temperature Controller Setpoint
	12	135	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Series 9200 Loop 3	13	136	1	1	Temperature Controller Actual
	15	138	1	1	Temperature Controller Setpoint
	17	140	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Series 9100 Loop 2	1	104	1	1	Temperature Controller Actual
	36	139	1	1	Temperature Controller Setpoint
	28	131	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Eurotherm Loop 1	1	1	1	1	Temperature Controller Actual
(Modbus Mode)	2	2	1	1	Temperature Controller Setpoint
	3	3	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Eurotherm Loop 2	26	1025	1	1	Temperature Controller Actual
(Modbus Mode)	27	1026	1	1	Temperature Controller Setpoint
	29	1028	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Eurotherm Loop 3	51	1049	1	1	Temperature Controller Actual
(Modbus Mode)	52	1050	1	1	Temperature Controller Setpoint
	53	1052	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
9500 Valve Controller Valve 1	30	130	1	1	Flow Actual
	56	156	1	1	Flow Setpoint
	54	154	1	1	Flow Percent of Full Scale

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
9500 Valve Controller Valve 2	31	131	1	1	Flow Actual
	66	166	1	1	Flow Setpoint
	64	164	1	1	Flow Percent of Full Scale

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
9500 Valve Controller Valve 3	32	132	1	1	Flow Actual
	76	176	1	1	Flow Setpoint
	74	174	1	1	Flow Percent of Full Scale

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
9500 Valve Controller Valve 4	33	133	1	1	Flow Actual
	86	186	1	1	Flow Setpoint
	84	184	1	1	Flow Percent of Full Scale

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
SSi 7SL Limit Controller	4	123	1	1	Limit Controller Actual
	8	177	1	1	Limit Controller Alarm Threshold (SP)
	11	310	1	1	Limit Controller Main Setpoint

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Flow Meter	1	16	1	1	Flow
	3	18	1	1	Setpoint
	0	0	1	1	<i>No Value Available</i>

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
UMC 800 Loop 1	0	64	1	1	PV Actual
<i>All Values are Floating Point</i>	4	68	1	1	Working Setpoint
	6	70	1	1	Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
SSi Quad DAC Ch. 0	10	10	1	1	DAC Out
	10	10	1	1	DAC Out
	16	16	1	1	<i>No Value Available</i>

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
SSi Quad DAC Ch. 1	11	11	1	1	DAC Out
	11	11	1	1	DAC Out
	16	16	1	1	<i>No Value Available</i>

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
SSi Quad DAC Ch. 2	12	12	1	1	DAC Out
	12	12	1	1	DAC Out
	16	16	1	1	<i>No Value Available</i>

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
SSi Quad DAC Ch. 3	13	13	1	1	DAC Out
	13	13	1	1	DAC Out
	16	16	1	1	<i>No Value Available</i>

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Yoko UT350/320	2	2	1	1	Temperature Controller Actual
(Modbus Mode)	3	300	1	1	Temperature Controller Setpoint
	4	4	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Yoko UP750/550 Loop 2	18	18	1	1	Temperature Controller Actual
(Modbus Mode)	19	101	1	1	Temperature Controller Setpoint
	20	20	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Yoko UP350	2	2	1	1	Temperature Controller Actual
(Modbus Mode)	3	138	1	1	Temperature Controller Setpoint
	4	4	10	10	Temperature Controller Percent Output

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Honeywell DCP551	4	259	10	10	Temperature Controller Actual
	5	702	10	10	Temperature Controller Setpoint
	0	0	10	10	Temperature Controller Percent Output

Events Instruments

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
AC20	50	310	1	1	Events Actual
(Modbus Mode)	50	310	1	1	Events Setpoint
	49	300	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Yoko 750	49	310	1	1	Events Actual
(Modbus Mode)	49	310	1	1	Events Setpoint
	49	310	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
ModMux	97	97	1	1	Events Actual
(Modbus Mode)	97	97	1	1	Events Setpoint
	98	98	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Events	59	178	1	1	Events Actual
(Modbus Mode)	49	168	1	1	Events Setpoint
	59	178	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Dualpro Events	82	178	1	1	Events Actual
(MMI Mode)	72	168	1	1	Events Setpoint
	82	178	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Carbpro 3.5 Events	8	43	1	1	Events Actual
(MMI Mode)	2	17	1	1	Events Setpoint
	8	43	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Carbpro 3.0 Events	8	43	1	1	Events Actual
(MMI Mode)	2	17	1	1	Events Setpoint
	8	43	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Eurotherm 2500	19	19	8	8	PV
(Modbus Mode)	5	5	1	1	Setpoint Loop 1
	40	40	1	1	Percent Output Loop 1

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
SSi_8_8	5	100	1	1	Events Actual
	3	98	1	1	Events Setpoint
	6	101	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Series 9200	5	176	1	1	Events Actual
	2	109	1	1	Events Setpoint
	4	175	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
Micrologix Modbus	10	110	1	1	Events Actual
RS-232	0	100	1	1	Events Setpoint
	15	115	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
MCMModule Modbus	10	110	1	1	Events Actual
RS-232	0	100	1	1	Events Setpoint
	15	115	1	1	Events Input

Controller	Source Location	Write Register	Read Scale	Write Scale	Description
PLC5DF1	10	110	1	1	Events Actual
RS-232	0	100	1	1	Events Setpoint
	15	115	1	1	Events Input

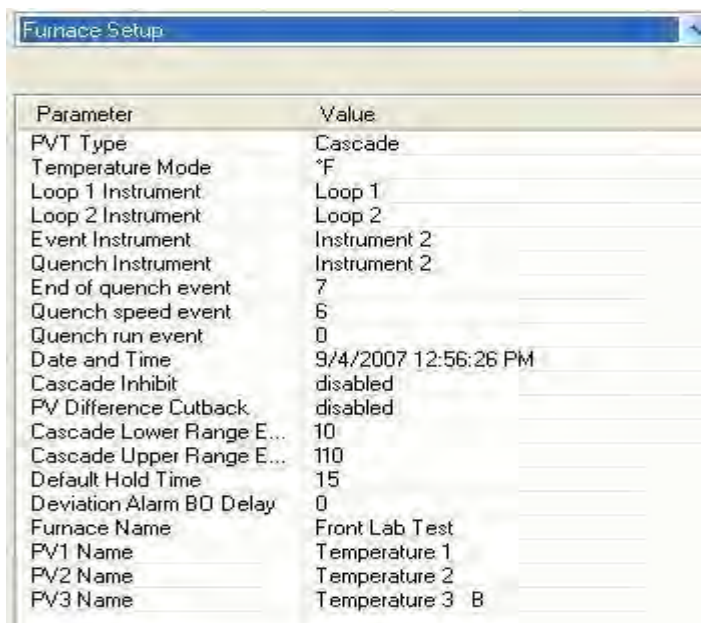
Controller	Source Location	Write Register	Read Scale	Write Scale	Description
SLKDF1	10	110	1	1	Events Actual
RS-232	0	100	1	1	Events Setpoint
	15	115	1	1	Events Input



Appendix G – Examples

Example 1 – Cascade Setup for the 9205

The 9205 can do cascade control using loops 2 and 3 and inputs 2 and 3 respectively. In cascade control mode, the output of loop 3 sets the setpoint of loop 2. The 9205 must be in Cascade mode in order for these settings to be applicable. To set the 9205 in Cascade mode, select the "PVT Type" item under the *Furnace Setup* menu. "Cascade" will be one of the options listed in the drop-down list that is displayed. Once this option is selected, there will be a few more options displayed on the *Furnace Setup* menu screen and the *PID Loop Setup* menu screen.



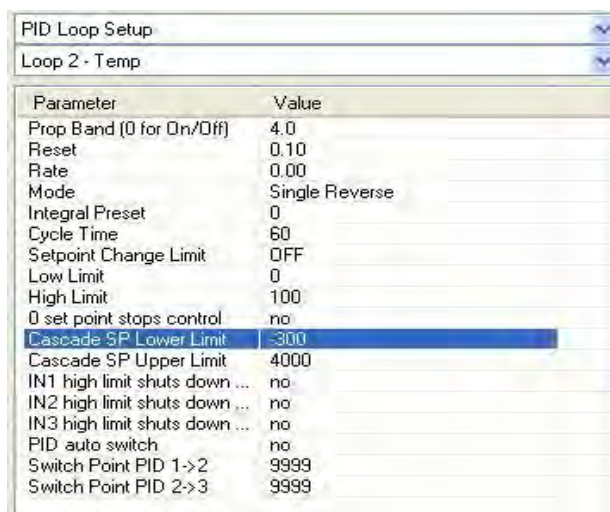
Parameter	Value
PVT Type	Cascade
Temperature Mode	°F
Loop 1 Instrument	Loop 1
Loop 2 Instrument	Loop 2
Event Instrument	Instrument 2
Quench Instrument	Instrument 2
End of quench event	7
Quench speed event	6
Quench run event	0
Date and Time	9/4/2007 12:56:26 PM
Cascade Inhibit	disabled
PV Difference Cutback	disabled
Cascade Lower Range EOPV	10
Cascade Upper Range EOPV	110
Default Hold Time	15
Deviation Alarm BO Delay	0
Furnace Name	Front Lab Test
PV1 Name	Temperature 1
PV2 Name	Temperature 2
PV3 Name	Temperature 3 B

On the *Furnace Setup* menu, there will be four more fields: Cascade Inhibit, PV Difference Cutback, Cascade Lower Range EOPV (End of PV Difference), and Cascade Upper Range EOPV.

Cascade Inhibit is one option for cascade control. The Cascade Inhibit will be either **enabled** or **disabled**. In normal cascade operation, the inhibit would be disabled. When tuning loop 2, however, it would be easier if the cascade inhibit is enabled so that loop 3 does change the setpoint of loop 2. The PV Difference Cutback will be either **enabled** or **disabled**. The purpose of the PV Difference cutback is to keep the PV for loop 2 from getting too far ahead of loop 3. The Cascade Lower Range

EOPV has a range of **-300** to **10000**. The lower range EOPV sets the point at which the maximum output of loop 2 begins to be limited. The Cascade Upper Range EOPV has a range of **-300** to **10000**. The upper range EOPV defines the point at which the loop 2 output is limited to 0%. For example, if the lower range EOPV is set to **10**, the cutback will begin when the loop 2 PV is 10 degrees greater than the loop 3 PV. If the upper range EOPV is set to **110**, then when loop 2's PV is 110 degrees above loop 3's PV, the loop 2 control output is limited to 0.


On the *PID Loop Setup* menu, there will be two more fields: Cascade SP Lower Limit, and Cascade SP Upper Limit. The value range of the setpoint is provided by these two setup parameters. When loop 3's control output is at 0%, the cascade SP lower limit is used. When loop 3's control output is at 100%, the



Parameter	Value
Prop Band (0 for On/Off)	4.0
Reset	0.10
Rate	0.00
Mode	Single Reverse
Integral Preset	0
Cycle Time	60
Setpoint Change Limit	OFF
Low Limit	0
High Limit	100
0 set point stops control	no
Cascade SP Lower Limit	-300
Cascade SP Upper Limit	4000
IN1 high limit shuts down ...	no
IN2 high limit shuts down ...	no
IN3 high limit shuts down ...	no
PID auto switch	no
Switch Point PID 1->2	9999
Switch Point PID 2->3	9999

cascade SP upper limit is used. The setpoint has a linear relationship with the loop 3 output and is computed by the following formula:

Loop 2 Setpoint = (Loop 3 Output / 100%) * (SP upper limit – SP lower limit) + SP lower limit
The Cascade SP Lower Limit has a range of **–300** to **4000**. The Cascade SP Upper Limit has a range of **–300** to **4000**.



Revision History

Revision Level	Date	Description	MCO #
-	5/26/06	Initial Release	N/A
A	1/24/07	Updated to Reflect Configurator 2.0	2042
B	3/28/07	Added menus for 9220, 9005, 9120, Appendices A, B	N/A
C	10/23/07	Added Tuning Assistant to 9200, 9220 menu; Added 8500 option (VR); Added 9205 Menu options; Added 9210 Menu options; Added 9215 Menu options; Added "Flash Card Management" appendix; Updated title page to reflect new logo; Added "Slave Instrument Mapping" appendix; Added "Examples" appendix (Example 1); Updated "Revision History" section; Updated menu headings for tool bar buttons; Added "SDRecorder Installation" appendix	2051
D	6/18/08	Updated "Flash Card Management" section; Updated calibration routine	2061